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VOLUME 16 NUMBER 1

JANUARY 1950

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NEW AIDS FOR GOOD PICTURE-MAKING

By Jacob Deschin, APSA

A new model Automatic Rolleiflex, incorporating the first major changes in this popular twin-lens reflex since the automatic film and shutter winding mechanism was introduced in 1937, leads off the news for this month. Announced by Burleigh Brooks Company, New York, Eastern distributors, just as we were going to press, the camera now has built-in flash synchronization and a new-type focusing hood. Simultaneously, the camera goes on fair trade, the agreement applying only to the new model. The new prices, which include eveready case, lens cap, cable release and excise tax, are $235 for the model with the Xenar lens; $275 for the Tessar lens model. Both lenses are coated.

The camera is now equipped with the new Compur shutter, which permits synchronization at a shutter speed of 1/50th second. Frank Rizzatti, sales manager of Burleigh Brooks Company, points out, however, that although the shutter is open for only 1/50th, the action-stopping power of the light at its peak is 1/100th. The shutter employs the new-type Continental standard plug with a three-foot extension cord.

The focusing hood has been redesigned to include eye-level viewing and focusing and a full-image magnifier that increases the ground glass image size more than three times. In addition, the catch has been eliminated from the hood cover, which is now operated by a toggle spring hinge on the camera front. The eye-level frame finder works by pushing in a front panel, which automatically positions a mirror in such relationship to the ground glass that the operator can focus the full image at the direct-view angle. Just above the focusing window is a small open-frame for viewing the subject directly.

The design of the case features the first major change in the eveready case since the latter was introduced for miniature-type cameras in the Thirties. The new cover has no catch, but is held in place by toggle spring action. To open the case, one simply lifts the cover, which then springs against the case's front, where it serves as a weight to keep the case out of range of the lens during picture-taking. The front straps to prevent the camera falling out of the case have also been eliminated; instead, the camera is held in place by two metal catches.

The first three-post-war cameras produced by Agfa Camerawerk, of Munich, Germany, now under American supervision, reached the United States recently and were distributed to photographic stores by the O. W. Ray Corporation, 353 Fourth Avenue, New York City, Eastern distributors. The cameras are the folding-type Ventura and Ventura DeLuxe, both of which take twelve 2¼ x 2¼-inch pictures on 120 rollfilm, and the Karomat 36, the latest quality-type 35mm miniature camera.

The Ventura, which costs $85, has a coated Anastigmat Agnar f/4.5 lens of 85mm focal length, stopping down to f/32; built-in synchronization; Vario shutter speeds 1/25th, 1/75th, 1/200th and bulb; built-in Newton viewfinder and instant shutter release lever. The Ventura DeLuxe is $89.95, equipped with a coated Anastigmat Apotar lens of the same speed and focal length. Its features include a synchronized Prontor V delayed-action shutter, with a self-timer and speeds from 1 second to 1/250th and bulb; locking device for time exposures; "red dot" double-exposure prevention device.

The bellows-type Karomat, which costs $179.50, features a new-type rapid film transport lever in place of the usual winding knob, and an automatic shutter cocking device and exposure counter. The lens is the 50mm f/2 coated Schneider Xenon. The Compur Rapid shutter, with speeds to 1/500th, has built-in synchronization. Focusing is by split-image rangefinder, which is combined with the view finder. The lens is focused by moving a lever, the bellows remaining stationery.

(Continued on page 7)

Read PSA's new feature
"How To"
On page 21

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"MR. PHOTOGRAPHY" . . .

An army of admirers learns with delight that while, after 50 years, Frank R. Fraprie, Hon. FPSA, has retired from the editor's chair at *American Photography*, he has more than 100 prints ready for exhibition. That means Frank Fraprie will continue to exert his beneficent influence upon photography, pictorialists still will have their inspiring pacemaker.

Generations of photographers owe their rearing, however distantly and by proxy, to Frank Fraprie. The people of photography universally admire him. If anyone in the whole wide world is entitled to be known, lovingly and respectfully, as "Mr. Photography," it is he.

It is good to know that while Frank Fraprie may not be active editorially in Boston, he'll be observant photographically in Gloucester. He's needed right now. It is becoming somewhat of a fad to decry pictorialism. Just why is not exactly clear. The disparagers offer no satisfactory substitute. Unable to make their meaning clear in words, they fail to explain it even by acceptable pictures. Increasingly, it becomes evident that they are interested more in argument than art.

Never the one knowingly to avoid an argument or to refuse to tilt a lance for the honor of his beliefs, only the inevitable years could keep Frank Fraprie from this fray. And if his pen be silent, his pictures shout.

Any of the Fraprie pictorials confutes the opposition. Prove that photography is creative. That artistry transcends the mechanical. That loveliness needs no supporting clamor. That he who really has caught the gleam can recapture it on sensitized film and paper.

Words say incompetently what Frank Fraprie means to photography, fail fully to describe his great contributions. Only the appellation, "Mr. Photography," seems adequate.—V.H.S.

PSA CONVENTION

Baltimore, Md., October 18–21, 1950

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NEW AIDS

(From page 5)

A $29.95 Kodak Pony 828 camera, especially designed for convenience and efficiency in taking pictures in color with the eight-exposure 828 film, is announced by Kodak. The new miniature has a Lumenized three-element Kodak Anaston 51mm f/4.5 lens, focusing from 2½ feet to infinity and has a new Kodak Flash 200 shutter with built-in flash synchronization and speeds from 1/25th to 1/200th plus bulb. The Pony has universal-focus markings in red at 1/50th, f/11 and 10 feet, and a red dot at f/6.3 for Kodachrome use outdoors. The body shutter release operates only when the camera lens housing has been extended and locked in picture-taking position, and the shutter has been cocked.

The Condor I, a new Italian 35mm miniature camera imported by Galileo Corporation of America, Inc., 745 Fifth Avenue, and costing $93, features a between-the-lens shutter on a collapsible lens mount of novel design. It has a coupled rangefinder of the superimposed image type in which color contrast images are employed for accurate focusing, and is adjustable for individual eyesight. The lens is a coated Galileo 50mm f/3.5 Eliog triplet, which collapses into the camera when not in use. The four-blade shutter has speeds from 1 second to 1/500th, and built-in synchronization for speeds to 1/100th.

Movies

DeJur-Amsco Corporation, of Long Island City, N. Y., announce two new 8mm movie cameras. One is the $99.50 Embassy with coated f/2.5 universal focus lens; the other the $69.50 Citation, the company's first rollfilm movie camera. The features of the Embassy include six speeds, magazine loading, ten-foot run on one winding and governor-controlled motor. The camera may also be bought with an f/1.9 coated lens in either a fixed-focus or focusing mount. Accessory lenses are a 1½-inch telephoto, a 9mm wide-angle and a 6½mm wide-angle attachment lens.

The Citation is equipped with an f/2.5 universal focus coated lens. Finished in silver-brown, the camera features a "no-jam" film gate, which opens wide for loading or cleaning, and being sprocketless, is loaded simply by dropping the film into position. Accessory lenses are f/1.9 lenses in fixed-focus and focusing models, and a 1½-inch telephoto.

The French Pathé Super "16" motion picture camera was introduced recently by Pathe-Cine, 521 Fifth Avenue, New York City, a division of Director Products Corporation. The new camera, which costs $395 without lens, features a full-frame focusing device for sighting directly through the lens during filming. Other features are: range of six speeds to 80 frames per second; variable shutter for variety of effects; runs thirty feet of film on one winding; weight less than five pounds; three-lens turret; built-in hand crank; automatic footage and frame counters; single-frame device and optical viewfinder.

The Bolex H-Model movie cameras now incorporate the Bolex Eye-Level Focus device, according to announcement by Paillard Products, Inc., 265 Madison Avenue, New York City. There will be no increase in the price of the camera. The device may be added to older Model H cameras for $37.75 plus tax. This precision instrument enables the photographer to focus through the lens and from behind the camera before taking each sequence. The focusing device magnifies the image ten diameters.

Projex, an auxiliary lens which is attached over the regular projector lens in order to increase the size of the screened image, is introduced by Spiratone, 32-34 Steinway Street, Long Island City, N. Y. The Projex, Jr., which more than doubles the size of the picture, is for 8 mm projectors and costs $9.95. The Projex, Sr., which quadruples the picture size, is for 8mm and 16mm projectors and costs $12.95. Principal advantage of the Projex is that comparatively larger screened pictures may be achieved in limited space.

Darkroom

The trend to cold light enlarging sources is pointed up by the introduction of still another enlarger employing these units. It is the DeJur Versatile line of enlargers, for which the company, DeJur-Amsco, of

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Long Island City, N. Y., now has a Koolite head containing a fluorescent grid cold light lamp. The new head is interchangeable with the standard condenser unit when a diffusion type of light is needed.

The Versatile enlargers may now be purchased equipped with the Koolite at the same prices as the standard enlargers, or the cold light units may be bought as an accessory at $18.75 for the models I and II or at $28.75 for the 4 x 5 model. The Koolite lamp has a working life of 10,000 hours, has a daylight quality, uniform color temperature throughout its life, high printing speed and operates on AC, consuming 30 watts of current.

For the youngster around 10 years old, the FR Corporation offers the $3.95 FR Snapshot Printing Kit, which contains everything he or she will need to make contact prints in a normally lighted room. An instruction book written in comic-strip style gives simple directions for using the kit's three plastic Printrays, one Printong, bottle of FR paper developer, bottle of Fixol and 25-sheet pack of Eastman Kodak Velite paper size 2¼ x 4½ inches.

The washing time of prints can be cut in half, according to Kodak, by treating the prints in an alkaline solution after fixation in an acid-hardening fixing bath and before washing. Kodalk Balanced Alkali is recommended because "it is odorless and, unlike carbonate, does not evolve gas bubbles in the presence of an acid fixing bath."

The method, which is used by commercial studios and photo finishers but is adaptable to amateur routines, calls for rinsing the prints, following fixation, for a few seconds in water, then placing the prints in a 2 per cent solution of Kodalk and agitating them for about two minutes. The prints should be separated frequently to insure access of the solution to both paper base and emulsion. After this treatment, wash the prints in the normal manner but for half the usual time, then dry. Kodak advises that the Kodalk bath be discarded after treating one hundred 8 x 10-inch sheets of double-weight paper per gallon, or 150 sheets of single-weight paper per gallon.

A 50-cent Kodak Developing Dataguide, a dial calculator indicating the correct developing times for various combinations of Kodak films and developers, is announced by Eastman Kodak Company. The guide is punched for insertion in the Kodak Photographic Notebook, or for hanging on a wall. The guide also has information on agitation during development, replenishment and storage of solutions.

A new-type water filter, the Aqua-Mite ($6.95), is announced by the Mansfield Aqua-Mite Filter Company, 3029 N. Austin Avenue, Chicago 34. The device is permanently installed with a conventional adapter for ordinary sink faucets or with an adapter for hose connections. Clear water is assured by the fact that it passes through a filter containing nine layers of fine screen, each of different mesh, then through three layers of chemicals, each separated by screens, and again through ten layers of the screen mesh.

A water filter with a permanent metallic filter element, which eliminates the need for filter replacements, is offered by Oscar Fisher Company, Inc., 109 Worth Street, New York City, at $17.50. The unit is made of plastic and bronze, fits standard one-half-inch pipe lines and weighs less than five pounds.

Another recent Fisher product is Fisher Polish, a new cleansing powder for spots, greasy fingerprints or discoloration of stainless steel darkroom or other equipment. The price is 79¢ a half-pound glass jar. The polish is applied with a wet cloth, and removed when dry with a clean cloth.

Lenses

For large movie houses and drive-in theaters, Bausch & Lomb Optical Company, 635 St. Paul St., Rochester 2, N. Y., have designed a line of f/2 lenses with a focal length ranging from 5½ to 7 inches. The series comprises eight lenses, each containing six lens elements coated with the anti-reflection Balcote film. The achromatic combinations are cemented together with heat-resisting thermo-setting materials and hermetically sealed to prevent exposure to dust or vapors.

The extremely fast 1½-inch f/1.3 telephoto 16mm Cine Balowstar movie camera lens, developed by Dr. Frank G. Back, inventor of the Zoomar lens, is now available. The price is $199, equipped with a standard Kodak mount. The lens will fit most 16mm cameras and, with the help of an adapter, nearly all 16mm and 8mm models. The lens is calibrated in F and T stops. The Cine Balowstar will take pictures, both color and black-and-white, under minimum lighting conditions, according to Jen Products Sales Company, 419 West Forty-second Street, New York City, a distributor.

HOW TO DO IT
See page 21

THE AQUA-MITE FILTER

Bell & Howell Company, of Chicago, announces it will materially increase its purchases of Taylor, Taylor Hobson lenses in 1950 because of a larger American demand for this product. The most famous of these lenses, the Taylor Hobson Cooke, is noted particularly for its high color correction factor.

Flash

A small repeating flashtube in the shape of the letter U designed to take thousands of pictures at 1/5000th second in low-cost, lightweight portable power speedlight units, is announced by General Electric Company. Designated the FT-110, this lamp has relatively low-voltage and a photographically effective light volume equal to the No. 5 flash bulb at 1/400th second. The new tube is filled with the gaseous element Xenon and produces light of daylight quality.

Although General Electric does not plan to produce the power packs, the company

FOREIGN DUES

The PSA Board of Directors has ruled that annual dues for foreign members—those residing outside of the United States—shall remain at the old figure of $5.00 in U. S. funds per year, plus $1.00 for *each* division affiliation. In other words the recent increase in PSA dues will not effect foreigners.

"Pops" Whitesell Lecture Tour

PSA members and their friends in the wide-awake cities of the West and Midwest will have the opportunity of hearing "Pops" Whitesell, FPSA, and Honorary Master of the PAA, describe and demonstrate the methods which have made him famous for his photographs of groups.

Through the facilities of the PSA National Lecture Program, "Pops" has been booked on a five week tour opening in Houston about the end of March and including the following cities: El Paso, Los Angeles, San Francisco, Sacramento, Seattle, Omaha, Minneapolis, Chicago, Ft. Wayne, Detroit, Cincinnati, Memphis and Oklahoma City. Negotiations for his appearance in a number of other cities en route are in progress at the time this is written.

On tour "Pops" will give a brief lecture illustrated by many of his more famous pictures. This is to be followed by an actual demonstration during which he will photograph groups selected from his audience. While he is arranging and posing his subjects, "Pops" will explain the reasons for their placement and the effect for which he is aiming. This will add materially to the educational value of the program, a phase which had to be slighted at the PSA St. Louis Convention because of the limited time allotted to him there.

After his return to his courtyard studio in New Orleans, "Pops" will process the negatives he makes during the demonstration and will send a print of the best to the sponsoring organization. Some he plans to submit to salons and exhibitions, so that many PSA faces are likely to appear on the walls of our art museums for the first time.

Everyone who heard him at the St. Louis Convention was completely charmed by the naive wit of this lovable old character, who admits he is 73 not 37, but exhibits vitality and energy which are the envy of many a younger man. The high esteem in which he is held was evident at the Awards Banquet when he received the Fellowship of PSA. Nor is the veneration of the man and the photographer limited to PSA circles. At its Chicago Convention last summer the professional association, the PAA, awarded him the rare and coveted Honorary Masters Degree, the ceremony being the climax of the Masters' Banquet.

By the time this reaches print the schedule will probably be complete but any organization on or close to the route indicated above may be able to obtain an open date by wiring or telephoning to P. H. Oelman at 311 Main St., Cincinnati, Ohio. The cost to the sponsor will be less than $100.

has demonstrated two types for which the new lamp was designed. One draws its power from ordinary household current and because of its weight of only three pounds (including lamp and reflector) may be attached to the side of a camera. The second pack contains batteries and weighs about five and one-half pounds. It is expected these two packs will serve to guide manufacturers in building power units for the market, which will consist largely of press and advanced amateur photographers.

A plastic dome-shaped shield for flash reflectors to prevent the danger of accident resulting from shattered lamps has been introduced by Nathan-Adler Associates, 139 East Fifty-seventh Street, New York City. The new shield is for 5½-inch reflectors, weighs less than 1½ ounces and has a highly polished surface on the inside, mat finish on the outer side for diffusing the light. The $1.29 shield is attached to the reflector and may be swung out of the way when changing lamps. The shield is available in white for general black-and-white work, or in blue for daylight flash photography in color.

The mounting brackets on two new Mendelsohn Speedguns fold alongside the battery cases for convenient storing in gadget bags. Designed for cameras with synchro shutters, the new guns feature lightweight Dural construction with satin finish, silver-plated contacts, positive grip socket, standard plug extension outlet and bulb ejector. The Series 1400, with three-cell heavy duty battery case and 7-inch chrome-plated aplanatic reflector for standard lamps, is $14.95. The Series 1200, at $11.45 takes three medium-size cells and has a 5-inch chrome aplanatic reflector for midget lamps.

The Kalite Flash Extension Unit, consisting of twenty feet of rubber-covered wire with standard household plug, and incorporating light weight and safety features, is Kalart's newest item. The $10.95 price includes a concentrating midget-lamp reflector with two safety features: a bulb ejector for discarding used lamps, and a built-in test lamp for checking continuity of circuit and possible short circuits. The three-ounce weight of the socket and reflector prevent sagging of the unit when its spring steel clamp is attached to a chair, a door, etc., for side light or extension flash work.

A transparent flash synchronizer, the Ray-O-Flash Synchromat, which is made of lucite, is offered by American Cinefoto Corporation, 1560 Broadway, at $12.50.

NOTICE

All applications for PSA Honors consideration in 1950 must be sent to Headquarters prior to April 1, 1950. This advance in date is required for adequately reviewing applications.

Honors Committee

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The President's Page

PSA is a big organization. Because of its size there is a growing possibility that valuable personal contacts between the membership and the officers may be lost. Under these circumstances, the Society's management sometimes lacks information necessary to make decisions.

There is also the danger that the individual member will lose interest because he feels that he has no part in the management of the Society.

In order for all of us to know each other better and to minimize these growing pains, it is our plan to print frequent "Messages to the Members." One of these follows.

Your officers and Board of Directors are grappling with 3 problems vitally important to the members: (1) Our policy with regard to PSA JOURNAL content, (2) Activities for beginning photographers, and (3) PSA Headquarters. Let me tell you about these problems.

PRESIDENT JOHN G. MULDER, APSA

PSA Journal Content

For some time there have been two schools of thought on what type of material PSA JOURNAL should print. Some feel that the JOURNAL should emphasize better photography and how to accomplish it, while another group feels that the JOURNAL should devote itself to publishing news and gossip about the members.

The how-to-do-it crowd feel that PSA members, above all others among the amateurs, are in a position to tell beginners how best to make good pictures. They say that our members who are new in serious amateur photography are anxious to read to-the-point, meaty articles on photography and that it is PSA JOURNAL's duty to supply such information. This group feels that gossip of the type now found in the Territorial Columns is so old by the time it is printed that it has little value to the reader and that it is interesting only to a small fraction of the membership, not to the mass. They maintain that PSA membership will become more valuable if PSA JOURNAL can change its policy in favor of articles designed to tell our members how to improve and enjoy their photographic hobby.

The second school feels that how-to-do-it information is already being covered in other photographic magazines and therefore is not necessary in PSA JOURNAL. This group looks at PSA JOURNAL mainly as a "house organ," and as such should tell what the members are doing and generally to print news. They feel that each member is interested in what the other fellow is doing.

At present PSA JOURNAL is in a position where it cannot publish both types of information without some elimination. This is another of those cases where we can't have our cake and eat it too. Therefore, we must decide soon whether to continue with the Territorial Columns and gossip or to change our policy and start printing information on how to make better pictures.

You can help by telling me which policy you favor. Just drop a penny post card to me at PSA Headquarters or at my office. You need merely say: "I am in favor of articles on how to make better pictures" or "I am in favor of printing PSA gossip."

Watch PSA JOURNAL for an accounting.

Activities for Beginners

The Board knows that we need activities for the newcomers in PSA. It realizes that one of PSA's objects is to foster and promote amateur photography and that one of the best ways to do this is to help beginners. Considerable thought is being given to development of a program for beginners. You can help us by sending in your ideas. Why not drop me a penny post card?

At present, we plan the following:

1. Beginning this month, PSA JOURNAL will print a monthly column designed to appeal to the beginner. It will emphasize "How-To-Do-It." This column will be on a temporary trial basis. Its continuation will depend upon member response.

2. A system of awards for achievement at levels lower than the top is being planned. Just what accomplishments will be rewarded and what the form of recognition will be has not been decided. Your ideas will be welcome.

3. As a result of a suggestion from one of the District Representatives, we are considering a Division for Beginning Photographers.

4. The National Lecture Program is being expanded further. Very soon there will be a west coast tour by "Pops" Whitesell and P. H. Oelman plans a tour along the New York Central from Cincinnati to Pittsfield, Massachusetts. By the National Lecture Program plan each local group in a given speaker's circuit pays the speaker for his appearance and later pays its prorata share of the traveling costs. PSA does the arranging at no profit. Contact P. H. Oelman, 311 Main Street, Cincinnati, Ohio for further details, if your Club wishes to participate in the program.

5. Expansion of Regional Conventions. For this activity we need local enthusiasm. Maybe you can stir up interest in your locality.

Headquarters

The greatest accomplishment in recent PSA history was the purchase of our headquarters building at 2005 Walnut Street, Philadelphia. By owning our own office building we need no longer pay costly rent and so money spent previously in housing will be available for other activities.

We owe much to the Cornerstone Members for financing this headquarters building purchase. A few more Cornerstone Memberships are needed to cover the purchase completely.

Notice that we have not asked the membership generally to pay for this building. Actually, the Cornerstone Members are making it possible for the regular active members to get more for their money than would otherwise be true.

If you wish to become a Cornerstone Member, note again the announcement printed in the 1950 PSA JOURNAL Annual, which, incidentally, took the place of the November 1949 JOURNAL.

Let me remind you, your comments on these matters are invited. Write to me at PSA Headquarters or at Building 26, Kodak Park, Rochester 4, New York.

JOHN G. MULDER, APSA, *President*

Frank R. Fraprie, Hon.FPSA

WE FELT that the most appropriate way to honor Frank Roy Fraprie, Hon.FPSA, upon his retirement as editor of *American Photography*, was to reproduce his favorite print, "Warmth of the Winter Sun," by the collotype process.

This print, which appears on the opposite page, has been hung in nearly 150 salons. It was taken in Taormina, Sicily, on orthochromatic film, 2 x yellow filter, 1/10 second at f/8. Mr. Fraprie tried for two years and made no less than 12 negatives before getting the light and position of the old lady, who objected to being photographed, exactly as he wanted them. The print is a straight enlargement from the whole negative without any hand work or dodging.

Mr. Fraprie's active participation in the photographic publishing field will be missed but his influence will be felt for many years to come. In his final editorial in *American Photography*, he stated that it had always been his policy to win "a recognition of the basic principle that photography as a means of expression possesses the essential qualities of truth, which leads to technical perfection, and of imagination, which leads to artistic excellence."

May he enjoy his retirement for many, many years to come. F.Q. Jr.

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PHOTOPROGRESS IN 1949*

By Glenn E. Matthews, FPSA †

The photographic industry along with other business in the world felt the effect of the general business recession that occurred during the year. Even so, production of sensitized materials and equipment continued at a moderately high level throughout the year and a number of new products were introduced. An appreciable capital investment in new and improved plant facilities was made in several plants in the past few years, one large company having spent more than 100 million dollars for such facilities. Employment in photomanufacture and sales fields had risen nearly 100 per cent since 1939 and some cut-back appeared likely, although one authority considered that employment in his concern would probably level off at about 50 per cent above prewar.

Materials and Equipment

Introduction of motion picture films on the new acetate stock, announced by Eastman in 1948, was proceeding gradually for both non-color and color pictures. No change in handling film on the new safety stock was necessary, compared with nitrate base, except that a different splicing cement was required.

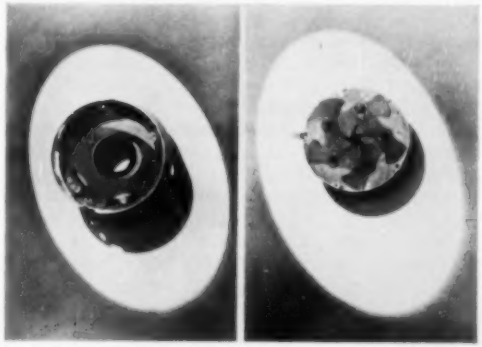
A significant development of the year was the announcement by the Du Pont Company in June of a new release positive color film in which a synthetic polymer or resin replaces gelatin. The film has three light-sensitive layers, each sensitized differently, the top layer being blue-sensitive, the middle layer, red-sensitive, and the bottom layer, green-sensitive. The light-sensitive silver halide grains are suspended in three synthetic polymer layers which combine the function of a carrier and color generators. The polymer molecules have attached to them chemically the necessary color formers to produce the subtractive printing colors, magenta, cyan and yellow, in the order named from top to bottom of the film. The silver grains, when developed, are intimately in contact with the color forming groups, which results in high efficiency of dye formation, increased resolution, and makes possible the use of very thin layers. Processing can be done on a slightly modified conventional type developing machine.

A completely new type of negative color film, known as Kodak Ektacolor, first announced in 1947 as a research development, became available to professional photographers in September. It is intended for exposure with artificial light. After development, the film presents a negative color image combined with positive colored masks. Matrices for color printing are made through appropriate color filters by printing onto a new panchromatic material called Pan Matrix Film. The making of color separation negatives is obviated. Finally, color prints can be made by any one of several known methods.

Ansco announced two new color films: Plenacolor Roll Film in 120 and 620 sizes to be developed to a color negative, and a duplicating color stock known as Type 232 for making 16-mm color prints. On the latter material the sound track will be sulfided for best quality sound.

The Kodak Flexichrome process is a method of making colored prints from black-and-white negatives or from color transparencies by hand coloring a gelatin relief image with dyes. The negative or transparency is first printed onto a special stripping film on which the relief image is formed, the silver is bleached out and replaced with a black dye called a modeling agent. The relief is then stripped from the film support and transferred to a paper support. As colors are applied with a brush, the black dye is displaced from the relief image. Corrections and changes were said to be done easily. This process was demonstrated first in New York in June.

Other new sensitized materials included the following: Ansco Monodex Paper (single contrast); Aspan Film (100 ASA Index) made in France by the As de Trefle Company; Du Pont High Speed Pan Type 428 Sheet Film (160 ASA Index); Gevaert Artona Paper (warm tone contact); Gevaert Diaversal Paper (positive from positive by diffusion to lower layer of unexposed silver bromide from top layer after development and removal



Eastman Kodak

Figure 1. *Between-the-Lens Shutter of New Design Having Accurate Top Speed of 1/800 Second.* Left view shows cover blades which prevent light from entering camera while shutter is being cocked. Right view shows five shutter blades that pivot and rotate to give one smooth continuous movement when exposure is made.

* Reprinted from the Americana Annual, 1950, yearbook of the Encyclopedia Americana.

† Technical Editor, Kodak Research Laboratories, Rochester 4, N. Y.

Eastman Kodak

Figure 2. Molded Field Lens Giving Increased Over-all Brightness. Lens resembles a flat disk with 200 or more tiny grooves molded into one side. Used in view finders and table viewer for slides.

of negative image in top layer); Kodacolor Film, Type A; Kodak Opal Paper K (warm tone); Kodagraph Autopositive Film (direct positive film for reproducing drawings). For scientific spectra studies in the extreme ultraviolet, an experimental emulsion was made available known as Kodak SWR Film. Photographic emulsions for nuclear track research were supplied by Eastman Kodak Company in pellicle form (approximately 250 microns thick) without the usual glass support. An improved nuclear track plate, designated as Kodak NTB-3, was introduced which is capable of recording charged particles at minimum ionization.

According to an article in the *National Photo Dealer*, more than 150 different types of cameras for still photography were on sale ranging in price from less than a dollar to $500. Price reductions were made on cameras and other equipment during the latter part of the year. Additions to the small camera market included the Ansco Automatic Reflex; Agfa Karat 12 with f/3.5 Apotar; Bolsey B-2 (35-mm); Ciro 35 and Ciro-flex, Model F; Century Graphic (2¼ x 3¼ with Graflok Back); Hasselblad Single-Lens Reflex; Ilford Advocate with Dallmeyer f/4.5; Kodak Tourist with Synchro-Rapid 800 Shutter; Kodak Reflex II; Royce Reflex with Wollensak f/4.5; Rectaflex (Italian) with stigmometer, a cylindrical lens and prism which distorts the image unless in absolute focus; Vidax (2¼ x 3¼); Zeiss Contax S. The Hasselblad camera is manufactured by V. Hasselblad Actiebolag at Goteborg, Sweden. It is made of stainless steel and has a focal plane shutter with eleven speeds ranging from one second to 1/1,600 second. The act of setting the shutter simultaneously winds the film (*U. S. Camera*, 12: 39, January 1949). The shutter on the Kodak Tourist is a radically new design, having blades that pivot and rotate through a partial circle inside the shutter housing. As the rotation progresses, the shutter opens and closes. By combining these motions into one smooth, continuous movement, shutter speeds are obtained double previous peaks in a shutter of this size. An accurate top speed of 1/800 second is obtained. (Figure 1.)

The Polaroid Land Camera was announced in 1948 and placed on sale in the United States in 1949. A print is provided in about a minute after the exposure, but no usable negative. The advantages and limitations of the camera were described in an article in the *Consumer's Research Bulletin* for July. A small exposure meter was made by the General Electric Company for use with this camera.

A few sub-miniature cameras were introduced, some shaped like watches and others like cigaret packets. Included in this group were the Japanese-made Steky, the Petal, the Rubina, and the Myracle II, and the German-made Steinbeck ABC. Most of these cameras use 16-mm film except the Petal which makes six pictures on a film disk.

Progress of operations and other clinical subjects may be recorded rapidly with the Coreco-Bucky Automatic Color Camera which uses a disklike shutter and synchronized flash illumination (*Phot. Age* 4: 16, April 1949). An experimental camera equipped with a 6-inch, f/1 lens covering 36 degrees of arc was built at the Institute of Optics, University of Rochester. It was said to be capable of exposing one picture per second and was intended for aerial photography and for reproducing x-ray images on fluorescent screens.

Approximately 45 different models of 8-mm and 16-mm domestic- and foreign-made cine cameras were sold in the United States according to an article in the February issue of *National Photo Dealer*. The trend of recent years appears toward more and more 8-mm equipment for home use with 16-mm sound film apparatus for business and educational use. New items in these fields included the following: Ampro Stylist 16-mm Projector; Bell & Howell Auto-8 and Regent 8-mm Projector; Cine-Kodak Reliant 8-mm Camera and Kodascope Eight-71 Projector; DeJur Fadematic Movie Camera and DeJur Projector (both 8-mm); three Revere 8-mm cameras, the Ranger, "77", and "67"; Turret and Revere "90" 8-mm Projector; Victor Envoy 16-mm Sound Projector. A new series of lenses for 8-mm and 16-mm cameras was described by J. D. Hayes and K. Pestrecov (*Amer. Cinemat.* 30: 348, July 1949).

A new type of molded lens known as the Ektalite Field Lens was announced in January. In appearance it resembles a flat disk with many small grooves molded into one side. Sides of the grooves near the edge of the lens have a high degree of arc while those near the center are almost flat. There are 200 or more ridges to the inch. The lens was used in the view finder of several cameras and in a table viewer for small slides to give increased over-all image brightness. (Figure 2.)

A photographic enlarger using a circular 22-watt fluorescent lamp inside a modified integrating sphere lamphouse was announced in September. The engi-

neering aim in designing this equipment was to produce the "coolest and most even illumination possible for the negative." The apparatus, known as the Kodak Flurolite Enlarger, was said to be very satisfactory for color work as well as use with black-and-white negatives. Cold light lamphouses were developed in several sizes to fit various enlargers by the Aristo Grid Lamp Company. One design called a Cold Light Pack could be used to convert a camera to an enlarger.

Other items of equipment included the following: Norwood V.P. Color Temperature Meter; Volomat Enlargement Densitometer (made in France); LaBelle "500" Automatic Slide Projector; Spencer MC Delineascope; and Leitz Bindomat for 2 x 2-inch slides.

J. I. Crabtree discussed "Rapid Processing of Films and Papers" (PSA JOURNAL **15**: 130, February 1949) and H. A. Miller, H. D. Russell and J. I. Crabtree gave details on "Direct-Positive Processing of the New Kodak Blue Base Reversal Films" (ibid. **15**: 382, June 1949). A paper on the "Chemical Economics of Spray Processing" was published by G. I. P. Levenson in the March issue of *British Kinematography*. At the fall meeting of the Society of Motion Picture Engineers, C. E. Ives and C. J. Kunz described rapid processing of motion picture film with types of equipment much more compact than that in current use. The equipment is stated to satisfy the needs also for television and field use.

A new research laboratory for the study of photomaterials and equipment under tropical conditions was opened by Eastman Kodak Company in March in Panama City, Panama. An educational institute of photography known as George Eastman House, Inc., was opened formally on November 9 at Rochester, New York.

Color Photography

With the slacking off in general business conditions and the accompanying drop in purchasing power of consumers of photographic materials, the amateur and professional for the first time since the end of the war was able to find adequate supplies of color materials. Some of these materials were also being shipped abroad and a few new processes were announced. A survey of color materials available and expected on the British market was published by W. D. Emanuel (*Photography* **4**: 25, May 1949). A concise review of processes of modern color photography was published by Mees (*Endeavor* 7: 31, October 1948).

Anscocolor Positive and Kodachrome 35-mm films continued to be very popular. The improved Kodacolor Film (daylight type) with colored coupler masks was reported to yield superior color prints, including Dye Transfer prints, compared with the older film. Supplementary data on exposure and filters for each emulsion of several types of color sheet films were being packed with every box of film. A new line of color compensating filters for use over the camera lens when making slight corrections in the color balance of the exposing light was announced by Eastman Kodak Company. The significant relation between light sources and colored objects was discussed by R. M. Evans (*Illum. Eng.* **44**: 47, January 1949).

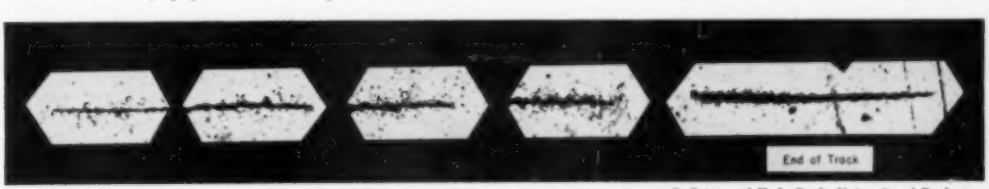
Better quality reproduction of color photographs and wider use of color photography to illustrate stories in many national magazines and other publications was noted in recent years. One of the most interesting set of color illustrations were those made by F. W. Goro for an article on the structure of the atom (*Life* **26**: 68, May 16, 1949). To get the uranium atom on one sheet of color film, four different lenses were used, the position of the film holder was changed 15 times and a total of 33 exposures were made.

According to a leading article in the October 5 issue of the *Wall Street Journal*, the well established position of the Technicolor Corporation in the field of professional color motion pictures was being challenged by processes being introduced by Ansco, Eastman Kodak Company and Du Pont. The Ansco process was announced in 1945 and consists of a multilayer film which can be exposed in any 35-mm professional camera, developed by reversal to a color positive from which duplicates are made. Details of processing were discussed in four papers in the July issue of the *Journal of the Society of Motion Picture Engineers*.

Trade tests were reported to be in progress on a new multilayer negative film known as Eastman Color Negative which, on processing, yields a color negative made up of yellow, magenta and cyan images. This negative is printed on another multilayer film called Eastman Color Print Film. A major advantage of these films was stated to be the convenience and speed of processing.

Thus far Du Pont had only announced a color print film for making color prints from separation negatives. This film is called Du Pont Release Positive Color Film, Type 275. Five papers describing the structure, properties, exposure, processing and sound-track printing of this film were read October 11 at the fall meeting of the Society of Motion Picture Engineers in Hollywood.

At the fall meeting of the SMPE, J. G. Capstaff de-



B. Peters and H. L. Bradt, University of Rochester

FIGURE 3. *Sections of Track of High Speed Primary Cosmic Ray Particle Identified as Iron Nucleus.* Stack of 45 NTB3 Plates suspended from a free balloon at 95,000 feet. Particle passed through 23 plates and recorded a track.

scribed an experimental 35-mm multilayer stripping negative film from which the two upper layers are wet-stripped separately onto special transfer supports before development. The resulting three films are then processed to give three color-separation negatives which can be printed by any one of several processes.

According to F. Hift in the October 15 issue of *Motion Picture Herald*, 39 feature pictures were processed by Technicolor in 1948 and about 50 were expected to be completed in 1949. Currently accepted color processes of all types could take care of no more than 80 features out of an approximate total of nearly 400 that were likely to be made during the year. Until the war, Technicolor had only 26 three-color cameras in this country and 4 cameras in England, as reported by F. J. Taylor in the October 22 issue of the *Saturday Evening Post*. Since the war, ten more cameras were built and the capacity of their laboratories in Hollywood was doubled. The 1949 output of the laboratories was expected to amount to 300 million feet of color film.

Cinecolor and Trucolor, both two-color processes, have offered some competition to Technicolor for several years; other processes such as Anscocolor and Polacolor were used chiefly for topical pictures or cartoons. In October, Cinecolor announced that they could undertake the processing of three-color feature pictures.

In France two additive processes of color photography were described which were known as Mondiacolor and Dugromacolor, respectively. The former was reported to be a four-color mosaic screen process (*Cinémat. franc.* p. 97, September 25, 1948) and the latter uses a beam-splitter and special lenses which distributes the light in three rays through red, green and blue filters to form three superimposable images (*Le Cinéopse* **25**: 4, February 1949).

Scientific Investigation

Investigations in nuclear physics with the aid of specially prepared nuclear photographic emulsions were conducted in the laboratory, on high mountains, and at high altitudes with the aid of free balloons. Nuclear track emulsions contain many times more silver bromide per unit area than ordinary emulsions. They are designed to record the tracks of electrically charged particles and when the developed plate is examined under high magnification, the number of grains in a track is counted, the curvature and length is measured, and from these data information is found on the nature and properties of the particle producing the track. It was reported by H. L. Bradt and B. Peters that nuclear plates are an excellent tool for the study of the heavier nuclei of the primary cosmic radiation, among which were found atomic numbers roughly between carbon and iron. Experiments were conducted with stacks of plates attached to a free balloon at over 90,000 feet (*Physical Review* **74**: 1828, December 15, 1948). (Figure 3.)

Several methods of recording electron tracks in nuclear emulsions were described by R. H. Herz who attempted to establish range-energy relationships for electrons (ibid. **75**: 478, February 1, 1949). Mesons were produced artificially in January in the new 130-inch cyclotron at the University of Rochester by bombarding a target with protons. A nuclear physics laboratory manual issued by the Heinicke Instrument Corporation, Rochester, N. Y., contained a well-written article by B. Peters on "The Interpretation of Tracks in Nuclear Photographic Emulsions."

In the preliminary tests with the great 200-inch Hale telescope on Mt. Palomar in California, galaxies of light as distant as a thousand million light years away were recorded on photographic plates (*Collier's* **123**: 19, May 7, 1949). (Figure 4.) A planned program of research with this mighty camera began which is hoped will reveal the size and composition of the universe. Work was about to start with the cannon-like 48-inch Schmidt telescope on a four year project to make an atlas of the universe (*N. Y. Times* **98**: 32, June 15, 1949). At each of two stations near La Cruces, New Mexico, a group of three cameras were being used to record meteors. From the photographs measurements can be made of the height of the meteor trails and their paths charted more accurately. From these data, the density of the atmosphere 50 to 75 miles up can be determined (*Sci. News Letter* **55**: 21, January 8, 1949).

A color translating ultraviolet microscope developed by the Research Laboratory of Polaroid Corporation was hailed as a new tool for biological research. The apparatus translates invisible images, detected in three narrow bands in the ultraviolet, by photographing them on adjacent portions of 35-mm film, developing and fixing them in a few seconds, and then projecting them through filters to give a visible colored image. The project is sponsored by the American Cancer Society and the Office of Naval Research (*Science* **109**: 371, April 15, 1949).

Research in phosphors (sensitive materials which glow in the dark) resulted in new ways to take photographs by heat. A screen is coated with the phosphor, and the heat radiation of the object, for example, a teakettle on a hot plate, is focused on the screen through use of a curved, metal mirror. Here under ultraviolet radiation the image can be examined or photographed. The use of phosphors for direct heat measurement is called "thermography." Research in applications of phosphors was reported by F. Urbach and co-workers in the *Journal of the Optical Society of America* for August.

An improved device that photographs objects, develops, fixes, washes, and dries the film in four seconds, and then projects it for inspection was built by the Kenyon Instrument Company for use by the Air Force and the Army Signal Corps. It may also be used for rapid processing and inspection of radiographs. The film magazine takes a film roll 400-feet long, enough to last seven hours of continuous operation. The processing solutions are used at about 135° F. This device was first described by F. M. Brown, L. L. Blackman and C. J. Kunz in 1946 (*J. Franklin Inst.* **242**: 203, September 1946).

In 1942 the American Standards Association at the request of the U. S. Army and Navy issued a "Photographic Exposure Computer" as an emergency standard (Z38.2.2–1942). It consisted of tables of light values

Mt. Wilson and Mt. Palomar Observatories

FIGURE 4. *Hale 200-inch Telescope Records Spiral Nebula Messier 81 in Ursa Major.* This photograph was made on February 18, 1949 with an exposure of 60 minutes. This nebula is about 3 million light years distant and its total brightness is estimated to be about 300 million times as bright as the sun.

for various geographical latitudes, months of the year, and hours of the day, and of tables for different types of scenes and sky conditions from which the correct exposure could be determined for a given negative material. Much of the data on which the computer was based were determined by L. A. Jones and H. R. Condit of the Kodak Research Laboratories and are set forth in a treatise entitled "Sunlight and Skylight as Determinants of Photographic Exposure" (*J. Opt. Soc. Amer.* **38**: 123, February 1948; ibid. **39**: 94, February 1949).

Photographs were released in August of the atomic bomb tests during 1948 on Eniwetok Atoll in the Marshall Islands (*Life* **27**: 74, September 12, 1949). (Figure 5.) What were believed to be the highest altitude photographs ever made from an airplane were taken with a new CA-8 cartographic camera installed in a "Banshee" Navy jet fighter. The photographs were made on August 21 from altitudes of 48,846 feet and 51,089 feet, respectively. Using a benthoscope diving bell, Otis Barton set a new deep sea diving record off Smuggler's Cove, California by descending to 4,500 feet. He also made photographs until his lighting system failed at 4,100 feet. Flash sequence photographs were taken at night from an altitude of about 2,000 feet over New York City on June 8 using K-24 (7-inch focal length) cameras and a new T-12 flash cartridge. Each cartridge was said to produce 50 million candlepower and to last 0.03 second. (Figure 6.) Approximately 260,000 square miles of Alaska were photo-mapped by the U. S. Air Force during the past three years.

New developments in equipment for aerial reconnaissance photography were described by Col. G. W. Goddard in the March issue of *Photogrammetric Engineering*. Various cameras are described ranging from 24-inch to 240-inch focal length. New types of flash bomb and flash cartridge will permit better night photography from high altitudes. One scheme called the "dust bomb" scatters the flash powder into a cloud where it is ignited to give a tremendous illumination. Photographs made with one new type of aerial camera were reproduced in *Life* for August 1, 1949. The film is exposed as it rolls past a slit behind the lens while the

U. S. Joint Task Force—7

FIGURE 5. *Atomic Bomb Explosion Test at Eniwetok in 1948.* Aerial view shows fireball and shock wave.

camera swings in an arc from horizon to horizon. (Figure 7.) At an altitude of 30,000 feet the camera takes in a span of over 450 miles.

Motion Pictures and Television

There was a marked increase during 1949 in the production of 16-mm films for various uses in education, business, science and entertainment. It is estimated that about 25,000 of the nation's 200,000 schools have projectors. About 500 feature pictures and topical subjects which had served their usefulness for theater showing were released in recent years for educational use. These films are released to schools or rented for moderate fees through museums or special libraries by Teaching Film Custodians, Inc. About 10 million feet of original Hollywood film now circulates under this program.

Improved films and equipment handled by skilled personnel having 35-mm production experience enabled the production of many educational and documentary films of a truly professional nature. An analysis of the content and application of several such films can be found in every issue of *Business Screen* and Educational Screen. One of the finest documentary films of recent years was Robert Flaherty's picture, "Louisiana Story," which won several international awards.

An expanded use was noted of motion pictures for scientific investigation in engineering, medicine, physics and other technical fields. Three symposia on high-speed photography were held by the Society of Motion Picture Engineers. Subjects discussed covered lighting, cameras, X-ray motion pictures, rocket and guided missile studies. A symposium was also held on February 17 by the Royal Photographic Society on the subject of gas discharge tubes for illumination for photography (*Phot. J.* 89B: 46, May-June 1949). P. Michaut published details on the scientific cinema in France and included developments in photography by infrared and ultraviolet radiation (*Sight and Sound* 18: 55, Spring 1949). An account of research and development work in stereoscopic motion picture systems by two British firms was published in May in *British Kinematography*.

Motion pictures for entertainment appeared to be entering a transitional period of their history. With the loss of a fair percentage of foreign business as a result of quota restrictions and exchange difficulties, the industry cut production schedules drastically from some 700 features in 1947 to about 400 in 1949. Even more significant was the very rapid growth of television and drop-off in theater box office receipts attributed in part to a willingness of many theater-goers to remain at home and watch their television sets. Various aspects of this whole problem were analyzed in the April issue of *Fortune* under the title, "Movies: End of an Era?" A round table discussion on the movies was conducted May 13–15 by *Life* magazine at San Bernardino, California, and the results were published in their issue for June 27.

Two basic systems of large-screen theater television were being evaluated by the motion picture industry: (1) the direct projection system whereby high-brilliance tube images are projected by a reflective optical system; and (2) the intermediate-film system using standard motion

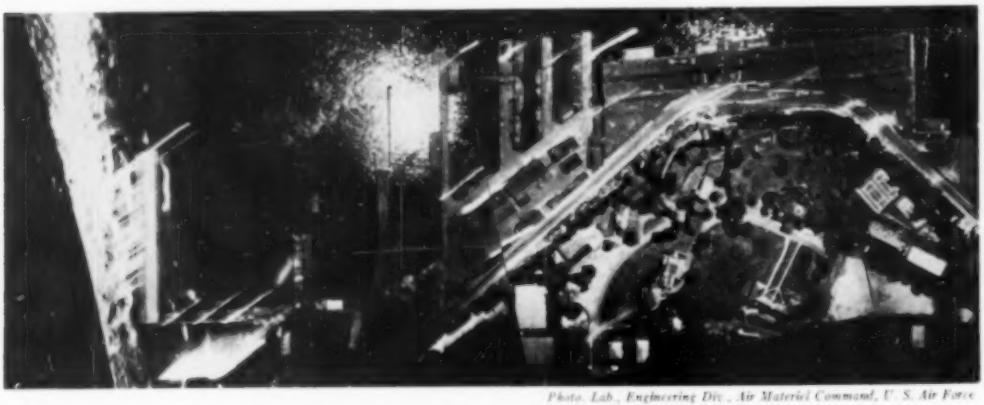


Photo. Lab., Engineering Div., Air Material Command, U. S. Air Force

FIGURE 6. *Night Aerial Photograph of Hoboken, N. J. Made with New Flash Cartridge of 50,000,000 Candle-power.*

picture technique from kinescope images photographed on film and rapidly processed and then projected. Information on both systems and their relative operational costs are given in a report of the Theater Television Committee of the Society of Motion Picture Engineers and published in that Society's Journal for March. In April a symposium on engineering techniques of theater television was held in New York by this Society and the papers were published in August.

The television film processing machine installed in the Paramount Theater in 1948 was used a number of times during the year. The President's " state of the Union " address given on January 5 in the House of Representatives was projected less than 60 seconds later in New York to the Paramount Theater audience, most of whom could probably see the expression on his face as well or better than those in the rear of the House of Representatives. An improved design of the intermediate film apparatus at the Paramount Theater, was installed in the Chicago Theater, Chicago, Illinois (*Internat. Projectionist* 21: 18, August 1949).

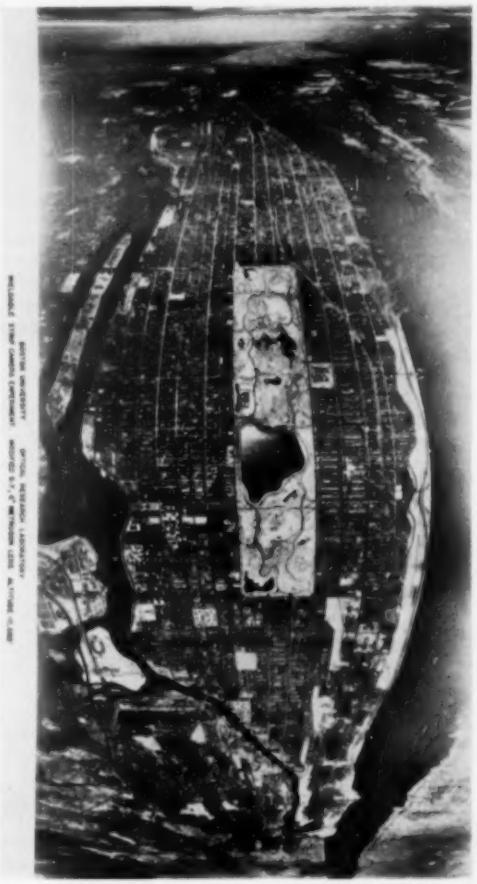
As the number of video transmitters grew in the country, the need for motion picture program material increased. Much of this material was adventure and mystery serial stories, each chapter being made to last 27 minutes. Time, Incorporated purchased the " Crusade in Europe " series produced originally by March of Time for Twentieth Century Fox Film Corporation. CBS-Television bought the rights to 52 full-length British pictures and Station WPIX, New York, added 36 British feature pictures to 24 Alexander Korda pictures already in its files (*Video* No. 24, March 21, 1949).

Two interesting television demonstrations were given at the Atlantic City session of the American Medical Association in June. Color televised images of actual operations were transmitted on a closed circuit from the Atlantic City Hospital to the Convention Hall where large groups of persons attending the meeting could watch the details on 10 receivers with 12 inch screens. Occasionally the color image was changed to black and white and the contrast was striking. The demonstration was staged by Columbia Broadcasting System with the cooperation of Smith, Kline and French Laboratories of Philadelphia. The second demonstration was concerned with television interpretation of roentgenograms. More exact interpretation and greater usefulness was claimed to result by changing the density and contrast of the transmitted images. Teaching in large lecture halls will be facilitated by this procedure. The demonstration was presented by the University of Illinois College of Medicine and conducted by the Radio Corporation of America in cooperation with E. R. Squibb & Sons (*J. Amer. Med. Asso.* 140: 1099, July 30, 1949).

Industrial and Technical Uses

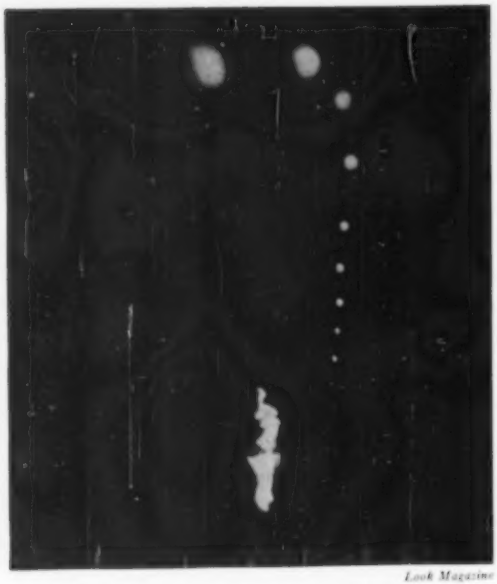
The tedious job of making an extended search of the literature on a subject will be simplified greatly by the use of a machine called a Microfilm Selector, of which an experimental model was built for the Library of the U. S. Department of Agriculture and the Office of Technical Services. The Selector, an electronic device, scans abstracts printed on 2,000-foot rolls of 35-mm film, and selects and makes copies of any abstract corresponding to a previously-selected code. The device scans 60,000 items in a minute and one reel of film can replace a half million library cards (*Ind. Bull.* of A. D. Little, Inc. No. 257, September 1949).

One of the largest microfilming projects ever set up was the copying of 22 million Veterans Administration premium cards on file in 14 different offices in this country. The job of copying them on 16-mm film was completed by Recordak Corporation in 18 weeks. Photoprints were also made exactly the size of the original card. Destruction of libraries in Germany resulted in a great dearth of books. Microfilming was being used to restock the



U. S. Air Force Photograph

FIGURE 7. *Manhattan Island from 10,000 Feet Photographed with Wieldable Strip Camera.* Photograph made with a 6-inch lens in a standard S-7 Strip Camera by rotating the entire unit across the line of flight. Experiment conducted by the Boston University Optical Research Laboratory.



Look Magazine

FIGURE 8. *Multiflash Photo showing a Baseball Curve.* Johnny Schmitz, pitcher of Chicago Cubs, is shown pitching a curve over the plate as camera registers 9 electronic flash records of the flight of the ball.

damaged libraries by making master copies on 35-mm film and printing on 16-mm film.

Many a baseball fan has argued for years on whether a curve ball thrown by a pitcher really curves. A series of tests were conducted in a dirigible hanger at Lakehurst, New Jersey. With the use of two cameras and 9 Kodatron flash lamps, nine images of the ball in flight were recorded on each film. John Schmitz, ace pitcher of the Chicago Cubs, threw the balls and the pictures proved conclusively that the ball actually curved; in fact, it was shown that it rarely goes straight over the plate. (Figure 8.)

Bibliography

A new magazine, *Functional Photography*, was launched in October for the professional and the technician. It is published by The Press Centre Ltd., 20 Tudor St., London E. C. 4. With the September issue, *Minicam Photography* (Cincinnati, Ohio) changed its name to *Modern Photography*. The *Penrose Annual*, well known British yearbook on the graphic arts field, resumed publication again after a lapse of eight years.

A list of new books includes the following:

The History of Photography from 1839 to the Present Day. B. Newhall. Simon & Schuster, New York.

Julia Margaret Cameron. Her Life and Photographic Work. H. Gernsheim. Fountain Press, London.

The Complete Photographer. Vol. 10, New Developments. National Educational Alliance, New York.

Fred Archer on Portraiture. F. Archer. Camera Craft Publishing Co., San Francisco.

Erith on Portraiture. J. Erith. Fountain Press, London.

Feininger on Photography. A. Feininger. Ziff-Davis Publishing Co., Chicago.

"Strobe" the Lively Light. H. Luray. Camera Craft Publishing Co., San Francisco.

Better Color Movies. F. Bond. Camera Craft Publishing Co., San Francisco.

Color Movie Making for Everybody. C. Cook. McGraw-Hill Book Co., New York.

Farbenfilm und Farbenphoto. M. Feiss. K. Meister, Geneva, Switzerland.

Aerial Photography in Urban Planning and Research. M. C. Branch, Jr., Harvard University Press, Cambridge.

Medical Photography. Radiographic and Clinical. T. A. Longmore. Focal Press, London, 4th ed.

Photographic Aids to Clinical Dental Practice. J. M. Dyce. Staples Press, New York.

Modern Photoengraving. L. Flader and J. S. Mertle. Modern Photoengraving Publishers, New York.

Elements of Sound Recording. J. G. Frayne and H. Wolfe. Wiley & Sons, Inc., New York.

Principles of Stereoscopy. H. C. McKay, American Photographic Publishing Co., Boston.

La photographie à l'infra-rouge. M. Deribéré. P. Montel, Paris. 2nd ed.

Photo-Almanach Prisma, Les Editions Prisma. Paris, 3rd ed.

Le cinema scientifique francois. P. Thevenard and G. Tassel. La Jeune Parque, Paris.

The Technology of 16-mm Sound Motion Pictures. W. H. Offenhauser, Jr. Interscience Publishers, Inc., New York.

Techia del Cine en Color. J. L. F. Encinas. Dossat, S. A. Madrid.

Meine Foto-Praxis. W. Heering. F. Bruckmann, Munich.

LIGHT TRIANGLE — Frank J. Heller

"How To"

No. 1—AGITATE BLACK AND WHITE ROLL FILM IN A DAYLIGHT DEVELOPING TANK

By Johnny Appleseed, APSA

Film developing is probably the least understood and most troublesome of all steps in photography. It causes more troubles to beginners than all other problems put together.

Certain agitation precautions are necessary in developing film in daylight tanks when the film is wound on spiral reels. These precautions avoid such troubles as air bells and development streaks of various types.

Be sure to load the film into the spiral reel so that it does not touch itself. That is, make sure that the film lies in the concentric spiral channels of the reel. There will be no development at points where the film touches itself. Practicing in white lights with scrap film is a good idea. The beginner will do well at first to use an orthochromatic film like Verichrome or Plenachrome, which can be handled in the light of a Series *2* safelight. This safelight provides enough illumination so that you can see what you are doing. Do not use the Series *2* for panchromatic films, though.

Better results are obtained by dropping the loaded reels into the developer than by pouring the developer on the film after placing the reels into the empty tank. For this reason, the tank should be filled with developer before the reels are loaded with film.

Immediately after dropping the reels into the developer, give the tank a few sharp taps or shakes to dislodge air bubbles from the emulsion surface. If this is not done, small transparent spots (air bells) will result and these will give black spots in your print.

Place the cover on the tank and if you wish, turn on the room lights. Start the timer.

The *kind of agitation* which you give will control the evenness of development from place to place in the roll.

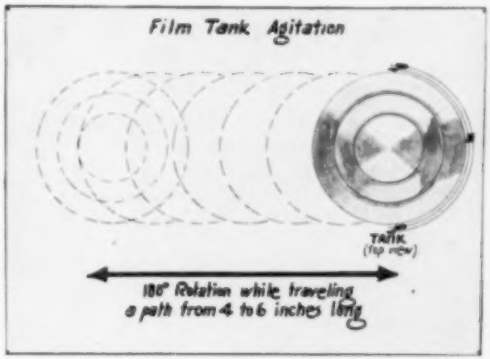


Figure 1. For best developing results, agitate as shown.

No agitation usually gives cross bars on the film and may result in halos around the areas of high density. Circular or swirling agitation sometimes gives streaks in the lengthwise dimension of the film. Cocktail shaker agitation gives high densities along the film edges.

To avoid these troubles, agitate as follows for the first half of the development cycle:

For fast-working developers (development is complete in 5 to 8 minutes).

Each 30 seconds move the tank briskly 4 to 6 inches across the table while rotating it about 180° as shown in the diagram. Move the tank in opposite directions on alternate agitations. After the first half of the development period, continue to agitate as before, but reduce the frequency of agitation to once every 1 or *2* minutes.

For slow-working developers (development is complete in 10 to 20 minutes).

Each minute move the tank briskly 4 to 6 inches across the table while rotating it about 180° as shown in the diagram. Move the tank in opposite directions on alternate agitations. After the first half of the development period, continue to agitate as before, but reduce the frequency of agitation to once every *2* to 4 minutes.

The *amount of agitation* which you give will control your negative contrast to some extent. Frequent agitation gives high contrast, infrequent gives lower contrast. These contrast differences are noticeable mostly as the amount of silver developed in highlight portions of negatives. The importance of this effect, in terms of print quality will be discussed in a future "How To" column.

Be sure to give adequate agitation during fixing, particularly at the beginning. Follow the same pattern as for development agitation.

Johnny Appleseed, APSA

American pioneer days are filled with folklore of such fabulous characters as Daniel Boone, Kit Carson, Buffalo Bill, and Johnny Appleseed.

It was Johnny Appleseed who prepared a way in the wilderness for those that should follow after, in the settling of the West. His life's work was to sow the West with apple seeds, making the wilderness to blossom their beauty and the people happy with their fruit.

Johnny Appleseed, APSA, will do likewise. He will sow the seeds of good photography everywhere that PSA Journal may go. In coming months, he will tell you in a practical way how best to do certain operations in photography. His column is especially designed for beginners.

PSA Journal invites you to read the column critically. Try what Johnny advises. Tell us how you succeed. Don't hesitate to suggest techniques on which you would like help. The most interesting comments will be published in PSA Journal each month.

The Editor

Follow the manufacturer's instructions for agitation of color film during processing. Do not use this procedure.

Next month: "How to Agitate Black and White Sheet Film During Development in an Open Tank."

Write to Johnny Appleseed

What would you like Johnny Appleseed, APSA, to tell you in subsequent months? A letter to him c/o PSA JOURNAL, Kutztown, Penna. will get answers to your questions.

Possibly you have worthwhile additions to what has been mentioned in this column. If you do, drop a line to the address above. Comments will be published in PSA JOURNAL as space permits.

The 1949 Progress Medal Award

In introducing the 1949 PSA Progress Medal Lecture at the St. Louis Convention, President John G. Mulder, APSA, made the following remarks:

At the suggestion of Joseph M. Bing, FPSA, and with the financial support of the Oval Table Society, the Board of Directors established the PSA Progress Medal in 1948. The first medal was given to Dr. C. E. Kenneth Mees, Hon.FPSA, at the 1948 meeting in Cincinnati.

The conditions of the award stipulate that it shall be given to a person who has made an outstanding contribution to the progress of photography or an allied subject.

In the absence of Donald McMaster, FPSA, Chairman of the 1949 Progress Medal Committee, it is my privilege to announce the winner of the 1949 Progress Medal. This year it goes to the illustrious J. Dudley Johnston, Hon.FRPS, repeatedly President of the Royal Photographic Society, and outstanding British pictorialist. Mr. Johnston's election was by unanimous recommendation of the Progress Medal Committee, who have presented the following citation:

This Progress Medal of the Photographic Society of America is awarded this year to J. Dudley Johnston of Great Britain because of his outstanding contributions to pictorial photography and towards the development and progress of photographic clubs and societies.

For more than sixty years Dudley Johnston has administered and advised in the cause of photography with patience, humanity and unwavering faith far beyond normal performance. His inspirational influence on the younger photographers continues to be of incalculable value to the cause of photography.

Reprint from The Royal

In commenting on the awarding of the PSA Progress Medal to Mr. Johnston, *The Photographic Journal*, the official publication of the Royal Photographic Society of Great Britain, has this to say:

Orrin Sage Wightman

J. DUDLEY JOHNSTON

The Photographic Society of America has chosen Mr. J. Dudley Johnston (Hon. Fellow) to be the second recipient of its Progress Medal, which is awarded for outstanding contributions to the progress of photography. The official citation reads:—*J. Dudley Johnston, O.B.E., Hon.F.R.P.S., 1949. For inspiring leadership, fostering photographic societies, absorbing knowledge of photography.*

Mr. Johnston's work for photography has been so closely allied to The Royal Photographic Society for many years that this recognition of his efforts by the premier American photographic organization cannot fail to give pleasure to all Members of the Society, who will wish to convey their heartiest congratulations to him on receiving this great honour, so richly merited.

Despite his advancing years, Mr. Johnston is still an active member of the Society's staff. Although officially designated "Curator," which entails the supervision of the Society's Permanent Collection, he is also responsible for the general organization of the Annual and House Exhibitions and for the work connected with applications for Associateship and Fellowship, which have increased considerably of recent years. He also maintains contact with affiliated societies and with oversea correspondents. His wise advice and long experience of photographic affairs are also available to the Council and to many Members of the Society, who avail themselves freely thereof on frequent occasions. Of his primary duties as Curator, it need only be said that he has been almost entirely responsible for building up the Society's collection of masterpieces of photography to its present standard. In 1923, when Mr. Johnston embarked on this task, there were about a hundred prints in the Collection, now there are more than 3,000 carefully indexed and stored, and their number increases each year as other gifts are made. Yet this great Collection has cost the Society only £10, which was incurred when 500 prints by the late Roger Fenton were acquired in 1932. Many affiliated societies have been grateful to borrow sets of prints from this collection in order to implement their own exhibitions.

In 1944, when the Society suffered grievous losses through the death of Mr. F. J. Mortimer, Acting Editor of The Journal, and its Secretary, Mr. H. H. Blacklock, it was upon Mr. Johnston, as Honorary Secretary since 1938, that the burden fell of conducting the Society's business through a most difficult period in its history. When eventually the present Secretary was appointed in October 1945, the services of Mr. Johnston were retained, on a salaried basis, in order to continue his work as Curator and to carry out the ancillary duties to which reference has been made. With the advent of a younger man, Mr. Johnston has taken a less active part in the general administration of the Society, but he is still available for invaluable help and guidance.

As Chairman of the Pictorial Group, an honorary post like that of all other Group officials, he has presided over the largest of the Society's Groups since the death of Mr. T. H. B. Scott, in 1943.

In the little spare time he has available, he is engaged on preparing a history of the Society, a task for which he alone is fitted by his intimate and unrivalled knowledge of the Society's affairs.

His work for photography gained official recognition last year, when he was awarded the O.B.E. for his services as Curator and Honorary Secretary of the Society. The award of the PSA Progress Medal sets a seal upon the great contributions which Mr. Johnston has made to photography and photographic organizations.

St. Louis Report—The 1949 PSA Convention

By Mel Woodbury, APSA

Dear Joe:

Well, just as I figured, you sure missed a grand and glorious four days when you passed up that invitation to "Meet Me In St. Louis." The gang up there did it up brown just as you and I bet they would.

First of all, they set Wednesday morning aside for registration and visiting around. Reunion day, they called it, and it really resolved itself into just that. The credentials were all ready for you in a package and it didn't take five minutes to register in.

Then you just wandered around to say howdy to the guys and gals you haven't seen since Cincy in '48. And it started the thing off in a homey and friendly atmosphere that just kept right on asserting itself all during the whole four days.

Committee and Division meetings, plus the first meeting of the Board were the only things scheduled that afternoon . . . so you can bet a lot more time was devoted to hand shaking. After all, that's one big part of the Annual Convention anyhow.

The Motion Picture Division swung into action first with programs Wednesday evening. The Color Division had a showing of the color and nature exhibition at the Jefferson and a bunch went out for the unveiling of the Annual Exhibition at the big City Art Museum out in Forest Park. Needless to say, it was up to all PSA standards.

The whole six rings of the circus got under way Thursday morning. You may believe it or not (and I sorta think you will) the big matter before the general membership meeting is still the content of PSA Journal. Yep, Joe, they still want to do something about it but they can't agree just what. You've heard the argument at the last three conventions, I'm sure. Well, they haven't changed a bit. Some want a technical magazine. Some want it to take on the format of a house organ. Some want it to compete with the monthly photo mags. Don't want to swap jobs with Fred, do you?

The Camera Club Committee had a nice session when they split the audience up into groups in accordance with club positions held and had discussions of the problems confronting club presidents, secretaries, program chairmen and the like. S. P. Wright did a nice job as skipper of the session.

The Technical Division, as always, did a bang-up job. Tim Holden took over the job of assembling the papers and Clyde Carlton had better look to his laurels as a program arranger. I think, Joe, you'd have liked the paper on the Speedlite by Harry Parker, the one on advances in enlarger illumination by John McFarlane and Joe Costa's discussion of the BC photoflash synchronizer in press photography. It seemed to me that there was a touch of showmanship added to the technical programs this year that have been lacking in the past. At any rate, they played a lot of 'em to SRO audiences and that's the proof of the pudding.

The Pictorial Division came up with a doggoned interesting, down to earth program when they put E. W. Blew on with a paper on travel photography. Now you and I may not be able to tour Europe, which Blew did this past summer, but we can sure learn a lot from what he had to say. And the beautiful part of this program was, at least from my standpoint, that it hit that big batch of PSAers who never hope to have a Hon. FPSA tacked after their name but who just get a whale of a lot of fun out of traveling the highways of the good old USA and recording their findings on some of Mr. Eastmans or Mr. Anscos or Mr. Defenders sensitized stuff. Incidentally, Blew says to avoid the *highways* and travel the byways if you're looking for pay-off pictures.

Your old pal, H. J. Johnson, presented Nick Haz on one of his sessions and as usual Nicky put on a real show. I sorta liked A. C. Shelton's presentation of a slide show on better color photography. He had some pretty swell stuff and told the wide-eyed audience how they could do just as well, by following a few simple rules.

Harris Tuttle's movie crowd entertained with some pretty fine films again this year. The one that hit the spot with me, and I heard quite a bit of comment on it, was Flower Ballet, by John Ott, Jr. I don't have to tell you that Harry Shigeta's premier showing of his Passion Play filming was a sell-out.

Incidentally, you'll no doubt be surprised to hear that Harris is retiring as MP Division high sachem and that Frank Richterkessing is succeeding him.

Pictorial Division (and had you heard that Gene Chase is the new PD chairman?) had another sparkler that you'd have loved, Joe. It was entitled "Manuscript to Magazine" and given by none other than the one and only Frank Fenner. It was a full hour of fact that you'd have eaten up, fascinating as the publishing business has always been to you.

Joe Dombroff, of Willoughby's, came down to accept the Progress Medal on behalf of J. Dudley Johnston, of London, England, and to deliver the Progress Medal lecture for Mr. Johnston. The subject was Photography and Progress, and

At St. Louis — Gordon C. Abbott, FPSA and Dr. Ernest To; the late Byron Chatto, Hon.PSA and Edwin F. Casper. All Convention photos by F. Quellmalz, Jr., Hon.PSA.

Pops Whitesell

IN CONFERENCE, one of the pictures taken by Pops Whitesell during his demonstration. Left to right: O. E. Romig, APSA, John R. Hogan, FPSA, PSA Secretary Sewell P. Wright, D. Ward Pease, APSA.

Pops Whitesell

NOBU OFFERS SUGGESTION, another print from Pops' demonstration. Left to right: Mrs. Nolan Shigeta, Harry K. Shigeta, Hon.FPSA, Mrs. Nicholas Haz, Mrs. Anne P. Dewey, Hon.PSA, Miss Doris Martha Weber, APSA, Mrs. Charles Walgreen, APSA, J. Philip Wahlman, APSA, and Nicholas Haz, FPSA.

Hermann Postlethwaite

Pops Whitesell, FPSA, arranges a group at St. Louis, while Miss Doris M. Weber, APSA, and Sewell P. Wright await their turn to pose for him.

through carefully selected slides the story was interestingly told.

Photo-Journalism is always a slow starter and a fast finisher and this year was no exception. I'll bet it was rough on Cliff Edom to have to forego that 32-0 walloping the Mizzou Tigers were giving Iowa State that Saturday, but he did and brought to the Convention his usual top-flight galaxy of stars. This time they came from the ranks of the St. Louis great moral dailies . . . *The Post Dispatch, The Globe Democrat* and the *Star-Times*. These papers were represented, in order, by Julius Klyman, Jack Zehrt and Ed. Swift. Jack was the goat when Cliff handed him the subject "What's Wrong With Salon Pictures." How would you have liked to have been in his place even if you were in your own home town?

It was good to see Louise Janson again, even if were just for a minute or two. She presented her usual well balanced program for the nature folks at their Friday afternoon session. "Nature Photography for Salons" by Mrs. Lorena Medbery was a highlight of the four hour session for the flower and bug folks.

Doggonit, Joe, I've just read back over the first pages of this thing and find that here I am on page 5 and I haven't even started to cover the convention. Of course, one guy couldn't see everything anyway. There's so much going on. A six ring circus wouldn't be so bad if only they didn't have six acts at once in each of the six rings.

Guess I'll just have to ramble around at a few of the things that stood out and let it go at that. First of all, there was that grand little fellow from way down south in New Orleans, Pops Whitesell. If you had trouble photographing Maude and your two kids in a group how do you think Pops felt putting on a demonstration of making a shot with eight in the group. He *done* it, Joe, right on the stage in front of everybody and in less time that it takes you to get Joe, Jr., to look at the camera. And it isn't going to surprise a single soul if Pops gets a salon hanger out of it.

Next thing that stood out was the weather. But maybe Jane and Gene would rather I say nothing about it. Anyway, it did rain the *Friday* field trip out, but those who made the Thursday tour came back really selling the St. Louis zoo and the showboat on the river. (No Joe, they didn't take us to the Budweiser plant. They didn't want St. Louis to suffer from a beer shortage the following week.)

And say Joe, have you still got that $200 in your right sock? If you have I'll tell you a good place to put it. At 10 AM on Saturday the Board approved a proposal of Stu Chambers that a new type of membership be offered, to be called a cornerstone membership, and that all income from this source be used in the financing of the new headquarters building, which we have bought at 2005 Walnut Street in Philadelphia. These Cornerstone Memberships will be limited to 250 in number and will set you back only $200, payable over a two year period. You'll get your name on a tablet or scroll or something in headquarters and you'll really be a big shot. Now comes the big news. This deal was okayed by the PSA brass at 10 AM. By eight that night fifty such memberships had been pledged. At the awards banquet a dozen more hit the sawdust trail toward Professor Chambers' rostrum. Yep, Joe, just like that. So if the moths haven't yet gotten into your wallet why not shake out those two hundred buck bills and get your name on the list. Of course, one of these Cornerstone Memberships is also a life membership in the society and in one Division.

And say, Joe, I'll bet you'll be as happy as I was that when they totaled up the votes on the members by members picture contest, Charlotte Fredrick copped the grand prize and what do you suppose with? None other than the series she made at the '47 Convention in Oklahoma. It made all of the 16 Oklahomans at the St. Louis shindig very happy about the whole thing.

John Mulder, APSA, George Blaha, and Jane Shaffer, APSA, with their leis, sent to St. Louis by Hawaiian PSAers.

At the PSA Exhibition: F. C. Kirby and Earl Clark; (center) E. R. Christhilf and L. T. Reed; S. P. Wright and D. Ward Pease.

And you've never seen anybody quite as thrilled as our little friend Anne Dewey when Mrs. Peabody presented her with the Peabody Medal for 1949. You're not going to believe it. I wouldn't if I hadn't been sitting six feet from her but Anne was actually speechless. I don't know of a grander person to have it happen to, do you? I mean the receiving of the medal, of course, not being rendered speechless.

The Banquet, of course, was a honey. Six good looking gals and a couple of guys from the Chase Hotel show entertained with songs from Broadway. John did a swell job presiding and Erle Buckley kept the crowd in good spirit with his master emceeing. And, if you've never heard Dr. Orrin Sage Wightman, you've missed a real treat. He's got one story about an Irishman who died and whose friends and enemies alike attended his funeral. But maybe I'd better save that and tell you in person. Fred would blue pencil it anyway as The JOURNAL still has to go through the mails.

Well, Joe, I wish I could mention every person who attended and every program that was put on. Everyone earned a mention. But if this letter runs too long Charlie Heller will begin to figure out how much extra paper it took to print it on and send me a bill for the space. And I want to save up my pennies for it's a long way from Oklahoma to Baltimore and the slogan has changed from "Meet Me in St. Louis" to "On to Baltimore."

But I am going to risk taking space to say that I think Gene, Jane, Fred, Stu, Ned and all the others earned a real pat on the back for a job well done.

Yes, Joe, you shoulda been there.

Regards,

MEL

Motion Picture Division Officials: Harris B. Tuttle, APSA, Mrs. Tuttle, Vincent H. Hunter, APSA, Mrs. Hunter, and Larry Sherwood, one of the Convention speakers.

The 1949 Annual Meeting

I—A MESSAGE TO THE MEMBERSHIP*

BY J. G. MULDER, APSA, *President*

Last year at the first meeting of the National Council, President Phelps set a precedent when he opened the meeting with a short talk in which he appraised the state of the Society. My remarks will follow this custom.

During the past two years, under the guidance of Charles B. Phelps, Jr., the Board has devoted much of its time to learning how to manage the Society's growing business and to assimilate the new By-Laws. You will be surprised to learn that the Board Members travelled a total of 24,657 miles, mostly at their own expense, to attend the Board Meetings of the past year. Many jurisdictional matters have been ironed out and I am glad to report that we can now go to a new phase of Board activity; namely the development of worthwhile membership services.

One of the greatest accomplishments of the past year is the Headquarters Building purchase. PSA has been dreaming for years of the day when it would have its own building and not be renting. In fact, in Philadelphia in 1943, Stuart Chambers, as one of the banquet speakers, told of a dream in which he had seen the great and beautiful home PSA would have "some day." Most of us listened with amusement. While some of the members were still dreaming, others were awake and working. By now, the rest is almost history. We took possession of our Headquarters Building early in November. This is one of the truly big happenings in PSA's history.

Charles Heller, John Magee, and Phil Cass are worthy of recognition for their foresight and efforts in finding this building and arranging for its purchase.

Let's not assume that the battle is over on the Headquarters matter. Far from it. We still need to raise much of the cost of the building.

Another highlight of the past year was the dues increase. Its net effect on the Society is difficult to estimate at this time, but you may be certain that it will be great.

Figure 1 shows what has happened to PSA membership over the period of the Society's existence. Note the phenomenally rapid growth during the 1945–1947 period. As beautiful as this may appear on a graph,

* Given before the PSA National Council at its Annual Meeting on October 21, 1949 at the Annual Convention in St. Louis.

S. Daikin, S. Vogan, Mrs. Vogan; (center) Mrs. C. Walgreen, her son & daughter-in-law; J. McFarlane, A. Stuber, C. Ruchhoft.

at St. Louis, Mo., in October

it was not entirely healthy for PSA. The new members greatly overtaxed our facilities; in fact, members came in faster than we could service them, and as a result, many have left us. This statement is proved by a glance at the delinquents' list which is populated mostly by people who first affiliated with PSA in 1946, 1947, and 1948. At present, despite the fact that a hundred or more new members come in each month, the exodus exceeds the income. These facts have caused your Board to focus its attention recently on membership benefits. Your officers look upon PSA as a business with a product to sell. We realize that PSA must deliver the goods now, more than ever.

It has long seemed to me that the amateur photographers can be thought of as a huge pile somewhat as Figure 2 shows.

These photographers can be divided roughly into three classes:

1. The casual snapshooters, composing by far the largest portion of the pile.
2. The serious amateurs.
3. The experts.

PSA has attracted and kept a small segment of the upper stratum of experts and rabid amateurs. Through our advertising and other efforts it has been possible to sign into membership photographers who are really part of the lower level groups. But many of our activities and policies are aimed at service for the few more accomplished individuals among us, with the result that the turnover has been terrific among the new arrivals. For some time, PSA has followed the policy of low dues to encourage these people to affiliate, but many have dropped out, when they did not find in PSA what they wanted and expected.

The $64 question for today is: At what level of photographic accomplishment shall PSA aim its activities?

It is my feeling that we must lower our sights, if we are to keep our new members. To do so, may require that some of us give up a few of our choice little benefits in order that PSA may become more attractive overall.

If we are to redirect our aims, in the hope of satisfying the average member, here are some changes which we might consider:

Conventions

1. Conduct more Regional Conventions.
2. Get wide geographic distribution of conventions.
3. Place greater emphasis on "How to Do It" lectures at various levels of listener advancement on convention programs.

Journal

1. Abolish Territorial Columns and other gossip and substitute factual information.
2. Print more "How to Do It" articles.
3. Print more good pictures and tell how they were made.
4. Since the JOURNAL does not pay for copy, set up an award system for best articles printed each year and thus attract high-grade writers.

Divisions

1. Expand activities to include members who are beginning in photography.
2. Offer as many worthwhile services in Divisions as possible *without payment of additional fees.*

Exhibitions, Competitions and Awards

1. Expand our awards system so as to recog-

H. K. Shigeta receives his Honorary Fellowship from Honors Chairman P. H. Oelman, FPSA; D. Ward Pease, APSA, who read the citation, looks on.

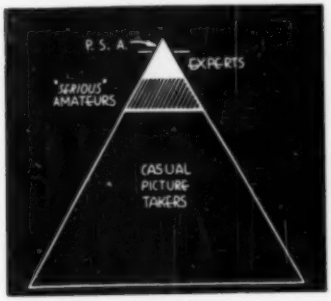


FIGURE 2.

FIGURE 1.

W. F. Swann, F. E. Carlson; the Cuban delegation with Angel de Moya on right; John Ott, Jr., and Robert H. Unseld.

nize progress at low and intermediate levels.

2. Conduct more frequent competitions.

3. Find new ways to recognize attainment in other fields than pictorial and research, such as writing, organization, lecturing, teaching, manufacturing, etc.

Adoption of these suggestions as general PSA policy should give us a bigger and better PSA.

II—THE NATIONAL COUNCIL

Present:

National Officers
C. Heller
H. J. Johnson
J. G. Mulder
P. H. Oelman
S. P. Wright

Board of Directors
Frank E. Carlson
Philip Cass
E. R. Christhilf
John H. Magee
Frank Richterkessing
C. C. Ruchhoft
Doris M. Weber
M. A. Woodbury

Honorary Representatives
Gordon C. Abbott, Mexico
Angel DeMoya, Cuba

District No. 2 Representative
John H. Magee

District No. 3 Representative
Mrs. Caryl Firth

District No. 4 Representatives
Earle W. Brown
C. J. Marinus

District No. 5 Representative
Hugh N. Montgomery

District No. 6 Representatives
Mrs. M. W. Lentz
Miss Jane Shaffer

District No. 7 Representatives
Sten T. Anderson
V. H. Hunter
Blanche Kolarik
D. Ward Pease

District No. 8 Representative
C. W. Getzendaner

The meeting was called to order at 9:30 a.m., The Jefferson Hotel, St. Louis, Mo., October 21, 1949, with the President in the chair. The roll was called by Secretary Wright and it was found that a quorum was present. National Council members were seated in the center section of the hall, leaving both sides of the room for spectators.

President Mulder opened the meeting by addressing the membership, appraising the state of the Society, and reporting on activities of the past year, as above.

The following is a report and discussion of the various items included on the agenda:

A. *How Can PSA Membership Be Made More Valuable?* .

C. W. Getzendaner (Forest Grove, Oregon) stated that prior to attendance at this meeting he had circulated a mimeographed letter to all member camera clubs in his district and all individual members in Oregon, Idaho, Montana, Wyoming, and Washington, advising members of the agenda for the meeting and requesting comments and suggestions. The following is a summary of the comments which he obtained:

1. PSA JOURNAL alone does not give the average individual his money's worth for membership in PSA.

2. Most pictorial members derive their greatest benefit from portfolios.

3. There is a definite need for regional conventions at which nationally known photographers and some of the national officers of PSA would be in attendance.

4. There is a desire on the part of some member clubs for more traveling shows or better use of the existing ones.

5. Publicity on PSA activities and benefits is badly needed. Many club and individual members know little or nothing about the shows, portfolios, etc., available.

6. In order for members to contact each other more readily in the large spaces involved in the western territory, it would be highly desirable to print the Directory by states.

There was considerable discussion regarding the worth of the JOURNAL and how its value might be enhanced.

Mrs. Martin Lentz (Wichita) advised that Territorial Columns be discontinued since they have limited interest and because the space could well be devoted to other material of more benefit. She stated that a poll of the membership in the Wichita area indicated that there is very little reader interest there for the columns.

Mrs. Anne Dewey (Chicago) felt that Territorial Columns are badly needed since they are the only means by which the membership can accumulate a background of human interest on the personages in the Society.

Dr. C. J. Marinus (Detroit) suggested the printing of territorial gossip on a separate mimeographed folder. He advised further that the JOURNAL adopt a policy of printing short, meaty articles designed to appeal to the beginner in photography, discussing little points of technique.

F. Quellmalz, Jr. (Kutztown, Pennsylvania) stated that the JOURNAL's general policy was established about 3 years ago. The Publications Committee awards space to various fields of photography on a proportionate basis as indicated by PSA Division membership. General interest articles are assigned to no division in this proportioning. Approximately 40% of the space is devoted to pictorial articles, 10% to color photography, 5% to nature, general articles run approximately 25% and the balance is technical. He pointed out that there are occasions when it is necessary to publish articles for reasons other than divi-

Clifton C. Edom, APSA, (right) introducing the Photo-Journalism speakers, which included Julius Klyman (left) and Lester Linck (center), who presided.

E. Wightman, J. Hogan, D. Weber; W. Fritz, H. Parker, Joe Costa, H. Edgerton; K. Pestrecov, G. Whitaker, Mrs. Whitaker.

sion membership basis. For example, technical articles are printed because of their lasting value.

P. H. Oelman (Cincinnati) stated that in the coming year there will be expansion in regional conventions. Efforts to establish a convention on the west coast have met with little success. Local spark plugs are needed to organize such conventions. Interested groups can expect cooperation from the Conventions Committee. It is absolutely impossible for the Society to go into a territory, bring an organization into it, and put on any kind of convention. Present plans call for regional conventions in the following cities during 1950: Rochester, Chicago, and Columbus.

The Secretary read part of a letter from Urban M. Allen (Hawaii), Representative from District No. 10. Mr. Allen proposed that PSA institute a print and slide criticism service for beginners, stating that such a service would be particularly valuable to photographers who do not live in the great centers of population. Allen also suggested slide lectures on "How to Do It."

Ralph Gray (San Antonio and Mexico) pleaded for expansion of the National Lecture Program as a means to increase the value of PSA membership. He emphasized the psychological value of judicious distribution of tickets to N.L.P. meetings.

E. W. Blew (Davis Dam, Nevada) suggested cooperation with professional photographers.

The Chairman asked for motions covering definite recommendations to the Board as a result of the preceding discussions.

E. W. Brown (Detroit) moved that PSA consider the JOURNAL from a standpoint of a magazine with appeal to the big majority and that it be improved to the point where it can be sold on news stands and in camera shops. The motion was seconded by Mrs. Lentz. The motion was lost.

Dr. Marinus moved that the President appoint from the National Council membership a committee of five persons to discuss the advisability of the formation of a new division to create a place in PSA for beginners and amateurs. The motion was seconded by John H. Magee (New York). The motion was carried. (President's note: This matter has been referred to Messrs. H. J. Johnson and C. J. Marinus for discussion and report. The Committee will be enlarged later.)

B. *Where Shall Managerial Power in PSA Be Vested?*

The Chairman called upon John R. Hogan (Philadelphia) to express his views. Mr. Hogan stated that in his belief, PSA management is too complicated. He deplored the competitive division setup and suggested that it be replaced by direct management of the Board.

Dr. E. P. Wightman (Rochester) passed out copies of proposed amendments to the Constitution and By-Laws, stating that he believed his system would give more adequate representation than the present one.

D. Ward Pease (Winnetka, Illinois) suggested that more power be concentrated in an executive committee of the Board, consisting of the elected officers.

There was no definite action in the form of a recommendation to the Board.

C. *What Shall Be PSA's Future Policy With Regard to the N.L.P.?*

W. E. Chase (St. Louis) summarized the accomplishments of the N.L.P. during the past two years and reviewed his recommendations as printed in the Committee Reports, page 557, October 1949 PSA JOURNAL.

No concrete suggestions resulted from the discussion which followed.

D. *Foreign Dues.*

Gordon Abbott (Taxco, Mexico) pleaded for reduced foreign dues in view of the existing exchange conditions. He stated that the $10 dues would force practically every foreign member to resign.

The Chairman referred to correspondence from other foreign representatives in this same regard.

Angel DeMoya (Havana, Cuba) substantiated the views of Mr. Abbott.

With the permission of the Council, the Chairman asked Messrs. Abbott and DeMoya to confer with the PSA Finance Committee, in the formulation of a recommendation which could be placed before the Board at its Saturday meeting. (President's note: The Board set all foreign dues, including Canadian, at $5 U. S. funds per year.)

G. *Future Policy on Entry Fees for PSA National Exhibition.*

Miss Jane Shaffer (St. Louis) stated incomplete information available to her indicated that the 1949 Exhibition had not suffered by the increase in entry fee.

No definite action was taken.

There being no further business, the meeting was declared closed at 11:30 a.m.

S. P. WRIGHT, *Secretary*

III—MEMBERSHIP MEETING

The meeting was called to order at 9:30 a.m., Jefferson Hotel, St. Louis, Missouri, October 20, 1949, by President Mulder. He explained that Vice President Scales, who was to have presided, was unavoidably absent. Mr. Mulder invited Treasurer Charles Heller to take the chair for the meeting.

Dr. C. J. Marinus (Detroit) spoke in behalf of the beginner and asked for more articles in PSA JOURNAL to help the beginner.

John G. Mulder, APSA

Lloyd E. Varden, FPSA, Jacob Deschin, APSA, Jayne Quellmalz and Fred Quellmalz, Jr., Hon.PSA, APSA, at the PSA Convention in St. Louis.

H. J. Johnson, D. Ward Pease, and Frank Fenner, Jr. addressing Camera Club and Pictorial Div. meetings at St. Louis Convention.

The Chairman asked for a discussion of this suggestion.

F. Quellmalz, Jr. (Kutztown, Pennsylvania), speaking for PSA JOURNAL and for the Publications Committee, stated that the JOURNAL invites member comments. He pointed out that rising publishing costs have created large problems, particularly because of the recent drop in JOURNAL income. Since the JOURNAL does not pay for articles, it is sometimes difficult to obtain the type of article desired. All photographs and plates used in the JOURNAL are donated by individuals or salon groups. He stressed the importance of the cooperation of each capable individual in the Society to make a bigger and better JOURNAL. Beginning in January there will be changes in the JOURNAL. A Technical Supplement will appear, a Motion Picture Supplement is planned for April and a Pictorial one for June. The 1950 Annual Issue will be published in December and will contain a special picture insert by collotype.

In the discussion which followed, Mrs. Charlotte Fredrick (Chicago) commented that PSA JOURNAL has never made a public appeal for articles. Leon Urbain (Chicago) pointed out that PSA JOURNAL must also serve as a "house organ."

In response to these comments, Mr. Quellmalz stated that PSA JOURNAL has a limited amount of space and that in order to include material not being printed now, some sacrifice of existing features would be necessary. There was discussion concerning the merits of Territorial Columns, participated in by Dr. E. P. Wightman (Rochester), Mr. Quellmalz, Walter E. Parker (Chicago), D. W. Pease (Chicago), Miss Margaret Peters (Cleveland), and Walter S. Meyers (Rochester). These individuals indicated their desire for an outstanding JOURNAL. It was pointed out that a large membership would provide sufficient budget to give a good JOURNAL.

No group action was taken with regard to the JOURNAL. A show of hands on the Territorial Columns was inconclusive.

K. Lynch (Tulsa) called attention to the problems associated with a large organization and requested that PSA consider seriously before expanding into a large, loose organization.

WILLARD MARTIN, PRESIDENT, PAA

Paul I. Gittings (Houston, Texas) introduced Willard Martin, President of the professional Photographers' Association of America, who spoke as follows:

Paul, Mr. Chairman. Distinguished guests, fellow members of the Photographic Society of America. Four board members of the professional Photographers Association of America have come to this meeting to bring our greetings and good wishes. They are: Commercial Vice President Ken Wright, First Vice President Paul Gittings, whose head always shows, and Director Laurence Blaker, and myself, of course.

When it was first suggested that the P.A.A. bring its official greetings, I thought it was a wonderful idea. But, when someone thought the President should be the one, I became very nervous and said, "Who? Me?"

I have done a great deal of trembling since that time because I have awe and reverence for the PSA. That is the same sort of respect that I had for the P.A.A. until they let down the bars and let just anybody be president.

After I thought a while, I thought that there really isn't much difference between the two organizations and the people. One is a bunch of guys who make photographs as good as they can because they want to, and the other does the same thing except that it is because they have to.

This is neither the beginning nor, I hope, the climax of the pleasant relationships between our two groups. Your arranging for us an invitational salon of the work of the star exhibitors of the Pictorial Division provided us with a wonderful addition to our Master's Exhibit at our Chicago Convention last summer.

Such things help to deepen and widen our appreciation of photography and of each other. The exhibit is now one of our traveling loan exhibits.

In exchange we have sent you our Master's Exhibit and it is now on display in Rooms 1 and 2 upstairs. In answer to a questionnaire sent to the Masters recently, they voted almost unanimously to continue and to try to increase cooperation between our two groups.

If I were an orator, I would say, "As long as our flag continues to wave over this land and symbolize the survival of American ideals and principles, may our two groups" — one making photographs to escape boredom, the other making photographs to escape the sheriff — "continue to develop separately and together our appreciation and taste and to improve and apply our technical skill until our land and our world became a happier place to live because we cooperated and competed."

But I am not an orator, so all I can say is thank you for having us. Good luck and God bless you.

W. E. Parker requested that discontinuance of PSA Chapters be discussed.

J. M. Miller (LaGrange, Illinois) pointed out that PSA Chapters provided a means of intimate contact not customarily found in clubs. He praised the former Chicago Chapter in this regard. He emphasized

P. H. Oehman and Philip Cass, Mrs. Stuyvesant Peabody and Mrs. Anne P. Dewey, and Dr. C. J. Staud at Honors Banquet.

the value of local organizations as groups available to sponsor meetings.

C. W. Getzendaner (Forest Grove, Oregon) reported for several members and clubs in the northwest, stating that there is a great demand for how-to-do-it articles in PSA JOURNAL because of the lack of other contacts where members are not close to each other. This geographical spread of membership makes formation of chapters difficult in the far west. In order to know who members are and where they live, Mr. Getzendaner suggested that the next Directory list members according to states, rather than alphabetically.

There was additional discussion regarding local PSA organizations, participated in by Mr. Madison (New York), Walter J. Pietschmann (Detroit) and Miss Eva L. Briggs (Detroit). Miss Briggs discussed the greater Detroit Camera Club Council and its method of uniting professionals and amateurs.

Mr. Heller called upon Stuart M. Chambers (St. Louis) to discuss his investigations with regard to chapters. Mr. Chambers stated that he had circulated a letter of inquiry to over 200 individuals in PSA, covering various types of members. He concluded that although certain chapters had operated successfully, it appears preferable to encourage camera club councils to perform the functions previously conducted by chapters.

No definite action was taken with regard to chapters.

Dr. E. P. Wightman discussed briefly the work of the Honors Study Committee and pointed out that changes in the system are being recommended. He invited comments.

There being no further business, the meeting was declared closed at 11 a.m.

S. P. WRIGHT, Secretary

OFFICIAL NOTICES

The first meeting of the Board of Directors for the 1949–50 term was held in the Jefferson Hotel, St. Louis, Missouri, on October 19, 1949. The meeting was called to order at 9:10 AM with the President in the Chair and the following Board Members present: Messrs. Carlson, Cass, Chambers, Chase, Christhilf, Heller, Holley, Howison, Magee, Meyers, Mulder, Oelman, Ruchhoft, Wightman, Wright, Woodbury, and Miss Weber. By request of Mr. Baumgaertel, Color Division Chairman, Mr. A. C. Klein was present. The following were present by invitation: Messrs. Getzendaner, Koch, Quellmalz, Swann, TerLouw.

The Treasurer's financial statements for July 31, August 31, and September 30 were accepted.

The following committee chairmanship appointments were approved by the Board, having been made by the elected officers to whom the committees are responsible:

Nominating
David J. Stanley, Chairman
Karl A. Baumgaertel
John P. Benus
Frank E. Carlson
Jane Shaffer

Stuart M. Chambers, Miss Betty Springer and Harry Shigeta, recipients of honors and awards at the PSA Honors Banquet.

Membership—Philip Cass
Exhibition—C. C. Ruchhoft
Conventions—M. A. Woodbury
Membership Relations—Stuart M. Chambers
Public Relations—B. Erle Buckley
Finance—John H. Magee
Camera Clubs—H. J. Johnson
Special Awards—George Blaha
Foreign Circuits—John Magee
Elections—Howard Small
By-Laws—H. M. Howison
Library & Historical—E. P. Wightman
Progress Medal
Adolf Fassbender, Chairman
Joseph M. Bing
George Blaha
Frank Fenner, Jr.
H. A. Schumacher
Stuyvesant Peabody Award
E. R. Christhilf, Chairman
Anne P. Dewey
Gottlieb Hampfler
C. J. Marinus
Hal Roberts
Frances S. Robson
P. L. Gittings

In view of his election as Secretary of the Society, S. P. Wright resigned as Representative for District #7. The Board unanimously accepted the resignation and approved the appointment of Blanche Kolarik to succeed as District #7 Representative.

The Board accepted the resignation of Harris B. Tuttle as Chairman of the Motion Picture Division and recognized Frank Richterkessing, Vice Chairman, as successor.

The Board accepted the resignation of Burton D. Holley as Chairman of the Pictorial Division. The appointment of W. E. Chase to succeed Mr. Holley was unanimously approved.

Dr. Orrin Sage Wightman, Hon.PSA (seated), George W. Blaha and Toastmaster B. Erle Buckley, APSA.

The Board approved the following Honorary Representatives to foreign countries:

Gordon C. Abbott—Mexico
J. Akkerman—Holland, Belgium, France
Nat Cowan—Union of South Africa
Raymond Caron—Canada
Dr. Esteban de Varona—Costa Rica
H. A. Larsen—New Zealand
Angel DeMoya—Cuba
Percy Harris—Great Britain
F. R. Ratnagar—India
Francis Wu—Hong Kong and China
Keast Burke—Australia

Mr. Heller reported that the Society would take possession of the new headquarters building during the week of October 23. The President instructed Messrs. Chambers, Heller, Magee and Cass to explore the possibilities of Life Membership as a means for financing the headquarters building and to report with specific recommendations at the October 22 meeting.

The Finance Committee was instructed to reconsider foreign dues in view of recent devaluation of several foreign currencies. The Committee was asked to report at the October 22 meeting.

Adrian TerLouw, present by invitation, discussed results of an investigation made by a Technical Division committee, in which services to teachers of photography were considered. The Board indicated considerable interest and asked that the Technical Division work up a definite proposal to be submitted to the Board at the next meeting.

The Board requested the Color Division to reconsider recent changes in the Maxwell Trophy rules.

The Board voted to abandon chapters in their present form and it was agreed to initiate proper action in the National Council to change the By-Laws accordingly.

The meeting was adjourned at 5:35 PM.

October 22 Meeting

The second meeting of the present term was held on October 22, 1949 in the Jefferson Hotel, St. Louis, Missouri. The President called the meeting to order at 10:15 AM. The following Board Members were present: Messrs. Blaha, Cass, Chambers, Chase, Christhilf, Edom, Heller, Howison, Johnson, Magee, Mulder, Oelman, Richterkessing, Ruchhoft, Wightman, Woodbury, Wright, Mrs. Janson, and Miss Weber. The following were present by invitation: Messrs. Fenner, Hunter, McFarlane, Swann, Quellmalz.

The President read a letter and displayed a report from Joseph Bing, Chairman of the Honors Study Committee. Following considerable discussion, participated in by members of the Honors Committee, it was decided to continue with the present honors system in view of the shortage of time available for making changes, particularly since the closing date for honors applications in 1950 has been established as April 1. P. H. Oelman, retiring Honors Committee Chairman, recommended that the secret ballot on Honorary Membership and Honorary Fellowship in the Board be abandoned in favor of open balloting. The

following recommendations were made by the Board to the Honors Committee for operation in 1950:

1. Publicize both the philosophy of the Honors Committee and its specific rules of operation.
2. Change the rules to permit application for Fellowship directly, as well as through a proposer.
3. Continue the Honors Recommendation Committees.

Reporting for the Committee appointed at the October 19 meeting, S. M. Chambers submitted plans for the Cornerstone Membership, details of which were printed in the November PSA JOURNAL. The Board accepted these recommendations unanimously.

The Board fixed subscription rates for PSA JOURNAL.

A combination husband-wife membership was established at $15, with the stipulation that this membership would be made only upon application and that it include one PSA JOURNAL.

W. F. Swann, reporting for the Technical Division on its investigation of activities for teachers in photography, stated that the Division has decided to carry on this activity. Unanimous approval was given.

The President announced receipt of wires from members of the Permanent Print Collection Committee, indicating the re-election of Wardlaw Hammond as trustee. (Note: Mr. Hammond was later re-elected Chairman.)

By letter, Victor H. Scales recommended the establishment by PSA of a class of awards designed to create publicity for PSA and to disseminate the impression publicly that the Society recognizes achievement. There was unanimous approval. A committee will be appointed to create a plan for such awards.

It was unanimously agreed to establish a PSA Who's Who pictorial listing. This activity was assigned to H. J. Johnson.

It was unanimously agreed to discontinue insurance on print interchange sets, since these sets are always insured as they are shipped by Railway Express.

A coordinating committee was formed to replace the Camera Clubs Committee, to be known as the Service Committee and to originate and prove new services to clubs, sections, and members. This will be a Standing Committee, of which H. J. Johnson is Chairman.

The next meeting of the Board was set for January 7 and/or 8, 1950 in Philadelphia.

There being no further business, the meeting was declared closed at 4 PM.

JOHN G. MULDER, APSA, *President*

JOINT MEMBERSHIP

A combination PSA membership is now available to husband-wife member teams at a bargain rate of $15.

The two members must file the same mailing address with PSA Headquarters. They will receive *one* PSA JOURNAL. One automatic division affiliation goes to each member. The husband and wife need not necessarily select the same division for membership.

This combination membership will be issued only upon written application to PSA Headquarters, 2005 Walnut Street, Philadelphia 3, Pennsylvania.

CHARLES HELLER, APSA, *Treasurer*

About Those Honors

At baseball games we used to throw pop bottles at the umpire. We did so because we disagreed with his decisions. As a matter of fact, the umpire usually had a closer look at the facts than we did and he knew the rules better than we did. The Honors Committee has had a number of verbal pop bottles in the last few years and for much the same reasons, so let's dig out the facts and tell you what the rules are.

Perhaps the most frequent missile was to the effect that poor old Joe Doaks was a marvelous photographer and turned himself inside out doing all the camera club's dirty work, then knocked himself out running photographic classes. He was passed by while some chuck that you never heard of was honored. The probable reason that Joe hasn't been honored, assuming he really merited it, was that nobody ever proposed him for honors. It is the job of the Honors Committee to elect or not elect candidates who are proposed by somebody else. It is not their job to seek out worthy candidates. In the past this has resulted in a sporadic and sometimes unfair distribution of honors. Many of the technical men, for example, have not been honored until recently because they are not the honors-seeking kind. The proposal part of the system is being improved by the appointment of Honors Proposal Committees in each PSA Division. It is their job to seek out the worthy candidates. So call the attention of the appropriate Divisional Honors Committee to the case of poor old Joe Doaks. If he really merits the honor, be assured that he will be elected.

Another difficulty with the previous system of proposal was that some of the applications were very poorly prepared. For example, it doesn't tell the Honors Committee much if you say Joe Doaks has held camera club offices and given classes. What camera clubs? What offices? What kind of classes and how many? Don't assume the Honors Committee knows your man. They make a very great effort to find out all they can about a man they do not know, but why make it difficult for them? Here again the proposal committees do a better job. You don't have to go through the proposal committee, but it will probably help your candidate if you do.

Why are honors given? For the same reasons as in any other human endeavor. We honor people who unselfishly and effectively devote themselves to their fellow men, who are effective in advancing a cause, or who add greatly to our knowledge. We do not honor people who work for a purely selfish desire no matter how good their work may be. So if our friend Joe has a good salon record but has not made public spirited efforts he does not rate. On the other hand, if he has worked hard and effectively for his fellow photographers and has a modest or no salon record, he will probably rate. This, of course, means doing a lot more than holding a few offices in one camera club.

Perhaps you did propose Joe and he was not elected. The same application will not be considered again because the committee does not reverse the previous committee's decision without additional evidence. If you feel that Joe really does rate, put in a new application quoting more evidence than the previous one did.

Don't propose anyone unless you sincerely believe that he rates. The application must be endorsed by two additional people and they will be approached in confidence by the Honors Committee for their real opinion of the candidate.

You can propose yourself if you wish, but it is much wiser to have someone else do so.

Exhibits are no longer required with applications. Such evidence is still desirable where the Committee would need these to know the calibre of a candidate's efforts. When a man has a published salon record there is no point in submitting prints. See the application form for details on slides, movies, and other evidence.

The deadline for applications has been set earlier than in previous years. The Honors Committee have found that in order to do a comprehensive job they must have the applications submitted to Headquarters by April 1.

While the application describes various honors we might report here what they are. Associateship is for advancement of photography and in a public spirited manner. Fellowship is for the same thing, but to a much higher degree. Associateship is usually awarded before a Fellowship. The Honorary Fellowship is for lifetime photographic activity of the very highest order, and is bestowed rarely. The Honorary Membership is for comprehensive organization work—effective club work in several clubs, directing salons and conventions, judging, and building up PSA.

The Honors Committee expects it will continue as a target for a few pop bottles. But before you take aim, pause and consider the situation. And remember, a pop bottle is an empty shell from which a lot of gas has escaped.

Application forms are available at PSA Headquarters, 2005 Walnut Street, Philadelphia 3, Penna.

PSA HONORS COMMITTEE

THE FOLIO Volume 3, Number 1

Devoted to News of the Pictorial Division of the Photographic Society of America

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2024 East 86th Street, Cleveland 6, Ohio

MEMBERSHIP

H. Jack Jones, *Director*
P. O. Box 220, Montgomery 1, Ala.

ORGANIZATION

John R. Hogan, FPSA, *Director*
1528 Walnut Street, Philadelphia 2, Pa.

IN MEMORIAM

Frances S. Robson, APSA

With the death of Mrs. Frances S. Robson of Vina, California, on November 26, 1949, after an illness of less than two months, the PSA, the Pictorial Division, and pictorial photography throughout the entire world lost a most loyal supporter and industrious worker.

Living in the homestead and farming with her husband and son a large part of the fabulous Stanford Ranch, Frances Robson was for many years an outstanding figure in California politics and women's organizations.

It was in 1945, when Frances consented to serve on the Pictorial Division Executive Committee, that she started her illustrious career of service to the Pictorial Division and the Society. From that time on, she served on many PSA and Pictorial Division committees, starting with the Portfolio Committee in 1945, and the Judges List for Small Camera Clubs Committee in 1946, and ending with the Stuyvesant Peabody Memorial Award Committee.

Being of English ancestry (her maiden name was Woolsey), Frances Robson became intensely interested in the International Portfolio activity, and joined the Second Anglo-American Portfolio when it was organized. Identifying herself with International Portfolios as fast as they were formed, she was a member of thirteen.

She became the American Secretary of the Second Canadian-American Portfolio, then Associate Editor of THE FOLIO for International Portfolios, followed by the office of General Secretary of the South African-American Portfolios, and finally Assistant Director of the International Portfolios. In the intervening time she assisted in the formation of other International Portfolios, the Chinese-American Portfolio being the latest.

Many of the International Portfolio services and features were conceived and put into effect by Frances Robson, such as the extremely popular composite prints that will remain as a permanent history of the start of the "Internationals," the Toning Booklet and many others.

A constant figure in the International Portfolio Room at the 1948 Convention, one of Frances Robson's last activities was the organizing of the International Portfolio activities at the 1949 PSA Convention — the many exhibits of foreign folios, the International Portfolio Secretaries' Conference, the International Portfolio members' register, and others.

A successful salon exhibitor in both black and white prints and color slides, Frances had many photographic interests in addition to her beloved international portfolios. She was a Pictorial Division Three-Star Exhibitor; a member of the Editorial Staff of the 1948 Pictorial Division Yearbook; received her Associateship in PSA in 1948; was a member of the California Camera Club of San Francisco, California, and a member of the Kamera Kranks of Chico, California.

In concluding this tribute to a departed friend and close associate, I wish to express a heartfelt appreciation of her sincere advice, inspiration, encouragement and loyalty, not only to myself, as the first Director of the International Portfolios and later as Chairman of the Pictorial Division, but also to each and every officer and worker in the Pictorial Division, here and abroad. The world-wide cause of pictorial photography is much the poorer for her passing, and many will there be who will miss her presence in pictorial circles.

Goodby, Frances. May God be with you — and you be with God.

BURTON D. HOLLEY, APSA

PSA INTERNATIONAL PORTFOLIOS

There are openings in the following PSA International Portfolios for Pictorial Division members who are interested in interchanging prints for comment and analysis with the leading photographers in foreign countries:

1st Caribbean-American
1st Chinese-American
1st Dominican-American
1st Egyptian-American
1st Costa Rican-American
1st Netherlands-American
1st Belgian-American
2nd South African-American
2nd Swedish-American
3rd French-American
3rd Australasian-American
3rd Cuban-American
4th Canadian-American
5th India-American

For information, write to Director of PSA International Portfolios, Jane J. Shaffer, APSA, 5466 Clemens St., St. Louis 12, Mo.

The International Portfolios

In the notebooks of different International Portfolios we frequently see the wish expressed that portfolioists of other countries would show more of their national scenes and way of living, and would more recognizably nationalize their photography in the sets of pictures which come from abroad. In the June 1949 Australasian *Photo-Review*, published by Keast Burke of Sydney, Australia, is found an article by C. P. Frames (from the Johannesburg Photographic Society Bulletin of February 1949), which refutes the impression that photographers of any country can be typed by their work. Mr. Frames says that there can be no such thing as a "South African School of Photography."

His article goes on to say:

> There can be no particular and peculiar style in rendering a picture. Individuals have adopted their own methods in portraying a subject, but this individuality lies in the technique employed, and the methods are open to copy by anyone who chooses to do so.

However, the author admits that there is a certain justification for this somewhat jumbled thinking on the question of a national form of photography, in one particular. He continues:

> We have in this country certain natural features in our landscape and in our peoples, which possibly can be matched nowhere in the world. If we draw on them for our subject matter, then indeed we stand a chance of turning out pictures which would be identified immediately as having originated in South Africa. But we certainly are not establishing any new line of thought, photographically. We are simply making use of the pictures that the country is capable of giving us.
>
> If anyone might be considered to have founded a truly national school of photography, then it must be those two veteran pictorialists, Will Till and A. v. R. Van Oudshoorn. For years these two specialists have gone up and down the country with their cameras, recording the thousand and one moods of nature that manifest themselves in the veldt and along the rock-bound coasts of our land. Everything has become subject matter for them, and once having seen their subjects and recorded them, there has been nothing further than interpreting these subjects in the manner which each of them considered most fitting to portray a mood. Miss Susan Buyskes and Reginald C. Morley have done similar work in other directions, and they, too, could hardly lay claim to being the founders of a "national" form of photography. Others, like Karel Jan Hora, have turned to the rendering of subject matter which could never be identified as emanating from *any* particular country.
>
> The point lies here — no matter where a photographer finds himself living or traveling, if he has the trained eye of the pictorialist, he will set himself to producing pictures of what he sees. So, all that remains for us in our humble sphere is to go forward patiently, photographing that which pleases us, and noting that some things inevitably classify themselves as coming from South Africa. But claiming that we are founding a new "school" of photography? Never!

Letter from England

Mrs. Katherine Stanley, Secretary of the Fourth Anglo-American Portfolio, recently received a humorous letter from Thomas A. Langley, the Secretary of this Circle in England, from which we quote:

> I think that between us we may make things hum in Circle No. 4 — they are a grand lot of chaps on the British side, several of them known to me personally. And from the writings in the Notebook, our American counterparts seem to be similar types.
>
> I note that you require news for *The Folio*, and you shall have it. H. H. Houghton, one of the members I know personally, has written, and sent to me the letter you sent to him. Blimy! That sentence is a bit involved. Also one he has had from Cecil Blay. The latter has suggested that "Aitchy" Houghton will take on the job of reporter for the Circle, and I think it is a fine idea. He's just the chap for the job. If there is anyone breathing who can pervert the truth more than he can, I've never met him! As he holds the same opinion about me, it looks as if you will have some fun.
>
> Perhaps you would like to know something about him, since he is to hold an "official" post. Well, he's a chap about so-tall, sandy-haired, with a horrid profile. But I'll give him his due — his profile is less repulsive than my own pan, looked at from any direction! He has a charming wife. I've never met her, but she must be! And two fine looking boys whose photos I've seen — said photos marred by the fact that they were "Aitchy's" own work. During the war, he was a Flight Lieutenant in the R.A.F. Intelligence (they took all sorts of types), and spent some of his time with a Box Brownie, or something, in a bomber over Berlin. Which reminds me. Some years ago, "Aitchy" was a member of an Advanced Workers' Pictorial Folio which held a competition. A Box Brownie was sent around with the Folio, and each member had to expose a film in it, process it, and submit a print to the Secretary. The prints were then forwarded to Kodak's for judging. "Aitchy" won the competition with one of the best landscapes you could ever wish to see. It was a two-horse plough on a hillside, with a marvellous cloudscape. He used a fast panchromatic film, and stuck a six-penny gelatin green filter over the lens cavity. All of which goes to show that, in spite of the banter, he knows his onions.
>
> During the war he sent me a letter, and the envelope was addressed to "Red Langley, Head of Erdington Gestapo." I went about for days expecting to see plain-clothes cops peering at me from behind trees. But apparently the postman was unimaginative.
>
> Now let's talk of something interesting. I have spent quite a lot of time recently at Derrick Kingsbury's. He has an enormous garden, semi-woodland, and as I am interested in all nature work, I have been along to his place. "Birds nesting." Very profitable it was, too. A spotted flycatcher had built a nest on the hinge of his coach-house door — a most convenient spot for me to make a series of photographs. And a hedge sparrow's nest in an adjacent hedge produced for me a young cuckoo! What more could a naturalist want? While I was busy on the job, Derrick flitted about with his pocket camera, making records of me at work.

Did You Know That — —

——George L. Kinkade, APSA, Editor of the Washington Council of CC's Bulletin, writes that the Chinese exchange exhibit is one of the best he has ever seen? He continues: "At the judging of the Northwest Salon in September, we observed that the prints from China were of a higher quality than those from any other country."

——Miss Alison Dickison, Secretary of the First and Second Canadian-American Portfolios, has written that she wants the Portfolio of Portfolios to circulate among the camera clubs in Canada to show them what the International Portfolios are like? Dennis R. Anderson, General Secretary of this activity, will arrange for the demonstration.

——Rennie I. Weber, General Secretary of the Canadian-American Portfolios, took a three-week vacation last fall, on a picture hunt in Estes Park and other sections of Colorado? We are looking for wonderful results in the portfolios, and salon and slide exhibit entries this winter.

——Speaking of vacations, Dennis R. Anderson and Mrs. Anderson went west twice last year, got as far as the Mortensen School in Laguna Beach, California—and no farther? William Mortensen's methods and models seem to have held the fort against all other claimants. He *did* visit Lake Tahoe but his films were ruined by faulty developer. So he plans still another trip to California, this time back to Lake Tahoe.

——The Greater Detroit CC Council issued an imposing, illustrated edition of their Bulletin, containing montages of Isadore A. Berger, APSA, and his travel talks, Nicholas Haz, FPSA, at work demonstrating a lecture, news items of all the Council Clubs, with their lecture courses, outings, programs and other activities? The Program Chairman is Miss Eva I. Briggs of Detroit, and the President is Walter J. Pietschmann, member of the First South African-American International Portfolio. Walter ends his page with an old Hindu proverb which all portfolioists might do well to take to themselves: "Help thy brother's boat across, and lo—thine own has reached the shore!"

——Angel de Moya, APSA, of Havana, Cuba, writes that travelling around and meeting photographic people is the most pleasurable thing he has ever done? He says further: "I love people, and enjoy immensely the opportunity to learn from those who know more, and to pass the knowledge on to those who know less."

DR. C. F. COCHRAN, *Associate Editor*

What kind of pictures do you like to make? If you can answer this question without hesitation, there is a strong possibility that you are on the wrong track!

It is well and good to be known for a certain type of picture, but there is a danger in too narrow specialization. It is one thing to do a certain type of picture well, and another thing entirely to be able to do *only* one kind of picture. If the assumption is correct that you wish to progress, it must be kept in mind that

there is only a very narrow and special type of progress possible in a rut.

A certain lady of my acquaintance is nationally known for her wonderful pictures of babies and children. She is known by many as a "kid photographer," which is perfectly alright, but the danger of this type of reputation and success is that all other branches of photography and photographic experimentation could very easily become a closed road to a more enjoyable exploitation of her hobby. Being a sensible person, this young woman has not settled down into a comfortable pattern producing only pictures and more pictures of the younger set. Some of her best pictures are landscapes and pattern shots in a wide range of types, styles, and subjects. And what has happened to her "specialty?" Very little, except that she is a better child photographer for having pursued the broadening experiences in other fields. All of this is told, not to condemn pictures of small fry, but to point out that we should not specialize in one thing, to the exclusion of all else, if we are to get the most out of our photographic activities.

It is far easier to get into a rut than it is to get out of one. Let us consider a hypothetical case. Suppose there is a lecture at your camera club on high key prints. One of the members makes one and through a combination of luck and ability, he comes up with one of those dandies which wins "Print of the Month" at the club, and immediately is accepted four out of the first five tries in salons. Here at last our friend has found the key to success . . . make high key prints. When you have a good thing use it, he thinks. The next year sees a very prolific production of high key prints from him and he enjoys a fair amount of success with them. He is known by many people as "that guy who makes the high keys," and he basks in the distinction of being a successful specialist even though his fellow camera club members are fighting off snow blindness from looking at so much white paper.

Now there is nothing essentially wrong in the situation of our "high key" friend. The catch is that he has practically given up all other types of prints. Anything which isn't high key is less than the best, in his opinion. You know and I know that he is missing something, and he is not getting the most out of his hobby. Gone are the thrills of experimenting and exploring the other avenues—and side streets—of photography.

As in the case of the "kid photographer," this is no indictment of the specialty, but rather a warning of the danger of going overboard within too narrow confines. What has been said about high key could be repeated about low key, red toning, nudes, trees, photograms, and almost any other branch or style or technique you care to name. You may be the best photographer of fireplugs in the world, but for your own sake, as well as the sake of your friends, you should also be able to make a passable print of a front door or of your Aunt Tessie.

Did you read page 21?
HOW TO DO IT

Contact Prints

It has been recommended several times in these columns that a contact print be included with your portfolio print in order that the other members of your circle and your commentator may know a little more about what you had to work with. It is still a good idea but it does not seem to have been adopted by all members. The reason for this is not too difficult to guess. Most of us do not make a contact print at the time we make an enlargement. As a matter of fact I have several friends who do not even have a printing frame or other facilities for making contact prints. When the portfolio arrives there are enough things which must be done in those five days. Since the contact print is not an absolute necessity, and since we are all ready to send the portfolio on its way and have forgotten to make it, it seems hardly worth while to set up everything to make just one small contact print. If that is the situation there may be some justification for it.

But there is a solution. Most of us make a special print for the portfolio. The majority of exhibition prints are not 11 x 14, and the majority of portfolio prints are 11 x 14, so I think it is safe to assume that special prints are made for the portfolios. It may be one o'clock in the morning, and you may be tired, but it will take only a few more minutes to make a contact print while you are making prints anyhow. So do it then, and both the large and small prints will be ready when you need them.

In the past the contacts have been pasted to the print folder as a rule. Norris Harkness, Photographic Editor of the New York *Sun*, and photographic author, has made what seems to be a very sensible suggestion regarding the small prints. It is Mr. Harkness' thought that if the print were pasted to a sheet of letter paper or some such, it would leave a good deal of white space around the print so that, if need be, the commentator could use this space for comments. Arrows could be drawn, indicating areas on the print referred to in the comments, cropping could be indicated, and in general, some work space would be available without cluttering up the folder or the big print. Sounds like a good idea. Give it a try.

Medal Award

This month we travel to New Jersey for our Portfolio Medal Award winner. The winner is Mort Goldman, Tom's River, N. J., and his print "Japanesque" travelled in PSA Pictorial Portfolios No. 41. It was accepted and hung in the 1949 Hartford International.

The picture was made one Sunday afternoon in August 1948 on Mr. Goldman's farm. He was walking out to the mailbox when he saw a butterfly on the grass along the road. It was dead, but very lifelike in appearance. Since Mr. Goldman had been thinking of a picture for a coming club contest, he began figuring how he could use the beautiful butterfly in the picture.

Using two stalks of rye grass that had gone to seed, Mr. Goldman made a table top setup by using the grass and the butterfly. The butterfly was placed on the rye grass by the use of glue. The weight of the butterfly was enough to bend the stalk and add to the composition. The picture was made with two floods and was exposed by meter. The camera used was a Rolleicord with a plus 3 supplementary lens and the picture was taken on Plus X film. The print that was accepted and hung was made on Opal G, developed in selectol and toned with selenium.

Each month brings us more Portfolio Medal Award winners. If you are eligible, remember that the supply of medals will not last indefinitely. The requirements are simple. If you have never had a print accepted and hung in a recognized salon you are eligible to try. If the first print that you have accepted and hung in a recognized salon is one that has travelled or is travelling in a PSA Pictorial Portfolio at the time of its acceptance by a recognized salon, you are eligible for the PSA Portfolio Medal Award. There are 100 medals to be awarded. After the 100 medals have been distributed, the prints that won them will be judged by a top-flight jury, and to the best print will go the Booth Tarkington Memorial Gold Medal. Following this, the prints will be divided into four 25-print shows which will travel in the U. S.

If you are eligible for the PSA Portfolio Medal Award communicate with Eldridge R. Christhilf and you will be supplied with an application card to be filled out and returned. Your application will then be passed upon and the award made.

Commentators

A conference of the portfolio commentators was one of the highlights of the Pictorial Division program at the St. Louis Convention. At this conference many of the problems of the job of commentator were discussed, and the enthusiasm of the meeting carried it overtime. The meeting will probably result in a better understanding between the commentators and the members of the circles. In view of the success of this discussion, plans have been made to have another conference at Baltimore in October.

The average commentator is a sincere and conscientious man or woman who is trying to render a service to the members. It is not always easy to know just what is wanted or expected from a commentator, no matter how good the intentions may be. This is where you can help. The desire is great to serve in the best manner, and if any of the members have any ideas for the improvement or broadening of the service rendered by this fine group of photographers, they are invited to express themselves on the matter. If you feel that there is any way to help in the important job of commenting, write a letter along the lines of: "What I expect from my commentator."

If you have any qualms about speaking freely, have no fears. If there is any

need for it, your letters will be regarded as confidential, so speak to your heart's content; we will welcome constructive criticism. And please don't minimize your idea. Do not think that you must come up with some world-shaking program which will revolutionize the whole system. A very small suggestion which may even seem trivial to you, might be the key to one of the irksome problems which beset commentators and the portfolios.

The portfolio office and the commentators themselves are always seeking ways to improve the portfolios and the help that they offer. It is quite likely that there are many ways in which the job of the commentator could be made even better than it is.

So write that letter and send it to Miss Doris Martha Weber, APSA, General Secretary, PSA American Portfolios, 2024 East 86th Street, Cleveland 6, Ohio.

Portfolios Serve Hawaii

During the past several months an effort has been made to include Hawaii in the portfolio program. Because of the distance, the first efforts were to set up a Hawaiian Portfolio in the manner and within the structure of the International Portfolios. All concerned realized that "International" was a misnomer, in that the Islands are certainly a part of the United States, but the physical limitations seemed to dictate such an arrangement.

Investigation of the express rates between the Islands and the Mainland revealed that the problem was not as great as was first supposed. The rates were far less than the initial, uninformed estimate, and consequently the supposed physical limitations largely disappeared. The cost of shipping to the Islands is about the same as a fair sized jump right here on the mainland. This is good news because now the portfolio member in Hawaii is just "folks" like anyone else and will gain the services of the commentators, the list of whom reads like a "Who's Who in Photography."

The Hawaiian members will be worked into existing circles or new circles as they are set up. No exclusive Hawaiian group will be formed, so that the Islander in a portfolio will be mixed with and have contact with Stateside photographers. Since the distance is greater and the time is a little longer, the trip will not be made for just one member. Perhaps four or five Island members will be enrolled in a portfolio, with the rest on the Mainland. Details will be worked out, but this is the broad, general plan.

PSA PICTORIAL PORTFOLIO NO. 5

Frank Fenner, APSA, Commentator, Chicago, Ill.
Dr. C. F. Cochran, Secretary, Chicago, Illinois
Ralph L. Harman, Lincoln, Nebraska
Sewell Peaslee Wright, Springfield, Illinois
A. E. Tucker, Bowling Green, Kentucky
Rowland H. Freak, Jr., New Orleans, Louisiana
Nina McAlexander, Birmingham, Alabama
James H. Hardy, Rossville, Georgia
Lewis D. Solomon, Miami, Florida
Everett W. Saggus, Elberton, Georgia
Richard F. Morse, Winston-Salem, North Carolina
Lt. Col. Fayette G. Hall, Fort Dix, New Jersey
John Firchette, Philadelphia, Pennsylvania
Harold B. Spriggs, Livingston Manor, New York
Felix J. Henrion, Steubenville, Ohio
Ivan D. Smith, Wayland, Michigan

PSA PICTORIAL PORTFOLIO NO. 7

Dr. J. P. Benus, FPSA, Commentator, Philadelphia
C. Elton Heglund, Secretary, Jackson, Michigan
Alfred Watson, APSA, Buffalo, New York
Edward W. Hutchinson, Sharon, Connecticut
Alfred Weber, Bridgeton, New Jersey
Thomas T. Firth, APSA, Trappe, Maryland
Frank R. Henningsen, Ocala, Florida
Coleman Dixon, Tallahassee, Florida
Watson McAlexander, Birmingham, Alabama
J. M. Endres, Jackson, Mississippi
Jack L. Lyons, Crowley, Louisiana
James B. Nevitt, Houston, Texas
Edward C. Palmer, Sioux City, Iowa
Vern M. Judd, Austin, Minnesota
Lou Armstrong, Marquette, Michigan
Ted Laatsch, Milwaukee, Wisconsin

PSA MINIATURE PORTFOLIO NO. 1

Edward E. Crosby, Chicago, Illinois
Dennis R. Anderson, New Castle, Indiana
C. Bronson Weed, New Haven, Connecticut
Ruth Hare, Newark, New Jersey
Jay McFarland, Petroleum, West Virginia
R. M. du Bruyne, Raleigh, North Carolina
Howard Van Buskirk, Jacksonville, Florida
Dr. W. A. Daniel, Jr., Montgomery, Alabama
Frank T. Shingler, Lincoln, Illinois
T. O. Seiberling, Bonne Terre, Missouri
William Cottingham, Winfield, Kansas
Col. Chas. J. Perry, El Paso, Texas
W. A. Carter, San Diego, California
Ben M. Knutson, Alamosa, Colorado
Alford W. Cooper, Worland, Wyoming

After inaugurating this activity, and successfully piloting it through its developmental period, the PSA Camera Clubs Committee has transferred the Camera Club Print Circuits to the Pictorial Division for continued and expanded operation.

It is with pleasure that we announce that the Director of this activity is William R. Hutchinson, Post Office Box 367, Newburgh, New York, from whom entry blanks or other information may be secured.

The rules of the activity follow:

CAMERA CLUB CLOSED PRINT CIRCUITS:

Eight (8) participating clubs will constitute a circuit.

Each club shall pay a fee of $1.00 for the season, circuits being organized immediately after the Director receives prints.

The season will comprise the period from October 1st to April 30th.

Each club shall forward circuit prints by prepaid express or parcel post—shipments to be made according to the schedule established by the Director.

Each club shall notify the Director immediately of the arrival and departure of the circuit. Cards supplied for this purpose should be mailed the same day shipments arrive and leave.

To help the Director establish a travelling schedule, each club shall supply him with all of the meeting dates during the period from October 1st to April 30th, at which the members may view the prints.

Each club shall submit three (3) prints to the Director, for starting the circuit. All prints are to be mounted on standard 16 x 20 inch mounts.

Each print, except for mounting, must be entirely the work of the maker.

A print shall not be entered more than once in these Camera Club Print Circuits.

The title, name of maker, and club name must be legibly printed or written on the back of each mount.

The Director will assemble all prints, establish each circuit, select a qualified pictorialist to comment on each print, and, at the end of the season, dissolve the circuit. Every print placed in the circuit will receive comments.

The circuit must be kept on schedule. When the shipment arrives, a club will remove its prints from the REMOVAL SECTION, place its new group of prints in the COLLECTING SECTION, and view all the prints in the VIEWING SECTION. Each club will make its comments on the prints in the VIEWING SECTION.

Any club not abiding by these rules, or unduly delaying the circuit, will be barred from future participation.

The PSA, the Pictorial Division, or the members thereof, shall in no way be held responsible for the loss or damage of prints.

CAMERA CLUB OPEN PRINT CIRCUITS:

Eight (8) participating clubs will constitute a circuit.

Each participating club shall pay a season fee of $1.00, none of which shall be refunded after a circuit has been established.

Five (5) circuits will comprise a season, circuits being started the 25th of October, November, January, February and March.

Prints must be in the hands of the Director by the 15th of the month. Prints arriving after that time will be held for the following circuit.

Each participating club shall forward circuit prints by prepaid express or parcel post, shipment to be made according to the schedule established by the Director.

Each club shall notify the Director immediately of the arrival and departure of each circuit. Cards supplied for this purpose should be mailed the same day the shipments arrive and leave.

To help the Director establish a travelling schedule, each club shall furnish dates, for three months, on which club members may view the prints.

Each club shall submit three (3) prints for each circuit. All prints are to be mounted on standard 16 x 20 inch mounts.

Each print, except for mounting, must be entirely the work of the maker.

The title, name of maker, and name of club must appear on the back of each mount, printed or carefully written for legibility.

No print may be entered more than once in these Camera Club Print Circuits.

The Director will assemble all prints, establish each circuit, furnish comments and criticism on each print by a qualified pictorialist, and return all prints to participating clubs after each circuit is dissolved.

Each club shall write a comment on each print in each circuit. Comment forms will be supplied by the Director, and the comments are to be sent to him.

Any club not abiding by these rules, or unduly delaying the circuit, will be barred from further participation.

The PSA, the Pictorial Division, or the members thereof, shall in no way be held responsible for the loss or damage of prints.

Anglo-American Club Interchange

After several months of planning and laying the groundwork for this new Pictorial Division activity, William R. Hutchinson, its Director, reports the first interchange to be made between a club on this side of the Atlantic and one in England. The first American group to participate in the Anglo-American Club Interchange is the Newburgh Camera Club of Newburgh, New York.

Under the present plans, the Newburgh club will be paired with one in England that comes closest to its own status as to the type of industry prevailing in the community, the size of the town, the number of members in the club, and the photographic caliber of the membership. Other similarities will also be considered.

The first exchange of prints will be accompanied by a commentary on Newburgh—its population, industry, historical background, scenic environs, etc. Also included will be a biographical sketch and portrait of each club member. In this manner, the groups will become well acquainted. The Newburgh Camera Club hopes to have about four interchanges a year.

Clubs in this country desiring further information on this activity, are invited to write to William R. Hutchinson, Director PSA Anglo-American Club Interchange, Box 367, Newburgh, New York. Interested clubs in England should communicate with Anthony Peacock, FRPS, APSA, 9 Woodland Avenue, Stoneygate, Leicester, England, or Cecil J. Blay, FRPS, APSA, 76 Culver Lane, Lyonors, Reading, England.

American Exhibits

Camera clubs and councils desiring to schedule American print shows during the current season should make arrangements to do so at the earliest possible date. Unless there is an unusual demand for a particular show, each exhibit is returned to the originating maker or group at the end of one year. For most of the present print collections, this means that they will be returned in July or August 1950. Consequently, requests cannot be accepted for their appearance during the Fall of 1950.

Other shows are expected to be available, however, and open dates should be be reserved for these exhibits in the 1950-51 club schedules. For complete information write to Ralph L. Mahon, Director American Exhibits.

News of the Pictorial Division

PSA Award of Merit

The Pictorial Division is pleased to announce that eleven members have been added to the list of Star Exhibitors, or have been advanced in rank, since the last report. They are as follows:

New One-Star Exhibitors:

Charles M. Tipple
Charles L. Wilson
Art H. Oehl
Everett F. Schafer
Dr. E. Throop Geer, Jr.

Rating Advanced From One-Star To Two-Star:

James A. McVie
Roy E. Lindahl

Rating Advanced From Two-Star To Three-Star:

Que Chin
Walter S. Meyers

Rating Advanced From Three-Star To Four-Star:

Carl Mansfield
P. H. Oelman

Applications for Star-Exhibitor ratings, or for advancement in rank, accompanied by confirming records, should be mailed to Warren W. Lewis.

New Associate Editor

W. Dovel Le Sage, Editor of *The Folio*, announces the appointment of Miss Charlotte Kessler of Topeka, Kansas, as Associate Editor of the department—"News of the Pictorial Division."

We welcome Charlotte to the staff of *The Folio*, her functions on which will start with next month's issue.

AN INVITATION

This is an invitation to every PSA member to participate in the PSA American Portfolios.

Enrollments are now being received in the following specialized groups:

PSA Pictorial Portfolios
PSA Portrait Portfolios
PSA Miniature Portfolios
PSA Control Process Portfolios
PSA Star Exhibitor Portfolios (for PSA Award of Merit Winners)
PSA Nature Portfolios
PSA Color Print Portfolios
PSA Photo-Journalism Portfolios.

For information concerning any of the above activities and for enrollment blanks address Eldridge R. Christhilf, Hon. PSA, APSA.

Pen Pals

There are many amateur photographers in foreign countries who desire to correspond with their American counterparts, and to exchange ideas, experiences and photographic magazines.

This fact is very evident from the instant and overwhelming response to a query in a magazine more than a year ago, asking if there was any demand for such a service. A call for volunteers has appeared in these columns also, and all the requests, thus far, from PSA members have been satisfied. However, there is a backlog of European applicants. Members in the United States who are interested in participating in this important activity are requested to send in their names, as soon as possible, to Edward J. Hobbs, Director, PSA Pen-Pals Service, 1673 Union Commerce Building, Cleveland 14, Ohio. Brief details of the activities of applicants would be helpful in finding correspondents with similar interests.

Camera clubs are also invited to consider whether or not their membership would be willing to "adopt" one or more foreign pen-pals, and treat it as a club project. If so, the number of pen-pals desired, and any other information should be sent to Mr. Hobbs.

In connection with this program, it is important to remember that photographers in the United States are able to obtain unrestricted supplies of materials of all kinds, but in Europe they have a shortage of materials and literature. Therefore, exchange of information would be most gratefully received by workers overseas.

Coming Salons Agreeing to Follow PSA Recommendations

NOTE: M—monochrome, C—Color prints, T—color transparencies. Entry fee is $1.00 in each class unless otherwise specified.

Detroit (M, T) Exhibited Jan. 22-Feb. 12 at Detroit Institute of Arts.

Wilmington (M, C) Exhibited February 5-27 at Wilmington Society of Fine Arts.

Western Canadian (M, C) Closes Jan. 21. Exhibited Feb. 18 to Mar. 2 at Art Gallery, Winnepeg Civic Auditorium. Data: Edward Matthews, 363 McMillan Ave., Winnipeg, Manitoba, Canada.

Circle of Confusion (M, T) Closes Jan. 31, Exhibited Feb. 12-26 at Whittier Art Gallery. Data: Roy H. Murphy, 717 S. Greenleaf Ave., Whittier, Calif.

Rochester (M, C in Pictorial, Nature, Press and Documentary; also T) Closes Feb. 10. Exhibited Mar. 3 to Apr. 2 at Memorial Art Gallery. Data: David F. Adams, Memorial Art Gallery, Rochester 7, N. Y.

Philadelphia M closes Feb. 13; T on Feb. 6. Exhibited March 4-26 at Free Library of Philadelphia. Data: Chantry W. Davis, Secy., 346 Penn Sheraton Hotel, 39th and Chestnut Streets, Philadelphia 1, Pa.

Montreal (M) Closes Feb. 13. Exhibited Mar. 10 to Apr. 2 at Museum of Fine Arts. Data from Miss E. Lawson, Apt. 7, 388 Oliver Ave., Westmount, Montreal, Ont., Canada.

Great Falls (M) Closes Feb. 15. Exhibited March 4-12 at Great Falls Public Library. Data: Miss Elwis Cahalan, Box 1997, Great Falls, Mont.

Boston (M) Closes Feb. 19. Exhibited March 19-26 at the Boston Camera Club. Data: Richard Cartwright, 87 Washington St., Milton 86, Mass.

Pittsburgh M closes Feb. 22; T Mar. 1. Exhibited Mar. 17 to Apr. 16 at Carnegie Art

Gallery. Data: Karl S. Leach, Secy., 92 Estella Ave., Pittsburgh 11, Pa.

Kalamazoo (M) Closes Feb. 27. Exhibited Mar. 12–26 at Art Center. Data: James D. Bobb, Jr., 119 N. Rose St., Kalamazoo 12, Mich.

Charleston (M, T) Closes Mar. 15. Exhibited Apr. 3–14 at Gibbes Art Gallery. Data: Mrs. R. M. Falley, 135 Meeting St., Charleston, S. C.

Washington (M, T) Closes Mar. 15. Exhibited April 2–May 7 at Corcoran Gallery of Art. Data: Mrs. Lee Beiser, 3119 Second Street North, Arlington, Va.

Port Colborne (M) Closes Mar. 18. Exhibited Apr. 8–15 at Port Colborne Camera Club. Data: J. H. Walter, 74 Steele St., Port Colborne, Ont., Canada.

Toronto (M) Closes Apr. 15. Exhibited May 1–13 at Eaton's Art Galleries. Data: Rex Frost, 37 Bloor Street, Toronto, Quebec, Canada.

Dixie (M) Closes June 15. Exhibited July 2–16 at High Museum of Art. Data: Cortlandt F. Luce, Jr., 517 Trust Co. of Ga. Bldg., Atlanta 3, Ga.

psa Nature

By Louise Brohman Janson, APSA
6252 S. Kedzie Ave., Chicago 29, Ill.

Brookfield Zoo Contest

The Third Annual Brookfield Zoo Contest was recently sponsored by the Nature Camera Club of Chicago and the Chicago Zoological Society.

The prizes for prints were won by Hal Hoberecht, Tucson, Ariz.; Bee Hoberecht, Tucson, Ariz.; Ben Hallberg, Brookfield, Ill.; Lillian Bloom, Chicago, Ill.; G. M. Bushman, Chicago, Ill.; Frank Fraser, Chicago, Ill.; Firmin Geeraerts, Antwerp, Belgium; August Hansch, Chicago, Ill.; Dr. R. R. LaPelle, Philadelphia, Pa.; David Levine, Philadelphia, Pa.; Don A. Navo, Philadelphia, Pa.; Richard A. Parker, Los Angeles, Cal.; R. M. Stevens, Chicago, Ill.; Raymond Wohlrabe, Seattle, Wash.

Awards for color slides went to Alice Stark, Toronto, Canada; R. L. Gearhart, Buffalo, N. Y.; Frank Bazzoni, Ottawa, Ill.; E. H. Bourne, Rochester, N. Y.; Lillian Gray, Chicago, Ill.; Mildred Holmes, Oak Park, Ill.; H. Kaltman, New York, N. Y.; Blanche Kolarik, Chicago, Ill.; J. F. Madsen, Berkeley, Calif.; Don Navo, Philadelphia, Pa.; Paul Rittenhouse, New York, N. Y.; Pearl E. Schwartz, Chicago, Ill.; Wes Stark, Toronto, Canada; M. Tenberg, Baltimore, Md.; James Whitehead, Leechburg, Pa.; and Joseph Tillbeck, San Francisco, Calif.

Signs in the Snow

The nature photographer who glories in the wealth of summertime subjects will find many things equally as fascinating in winter. Though the richness and splendor of summer have been swept away, the stark simplicity of this season presents unlimited picture possibilities. The hills and hollows no longer display splashes of quiet green, but take on a frigid and frosty appearance. The somber outlines of the trees are softened by the play of sunshine and shadow upon them. White meadows are cheered by the muted music of streams margined with glistening frost and bright as with their borders of summer blossoms. Excellent in black-and-white and magnificent when photographed in color are these winter-time scenes.

The greatest glory of the Northern winter is its storms which have the power to transform the world into an enchanted wonderland. The majestic ice storm comes as gentle rain and sleet, freezing as it falls and leaving the earth encased in glittering crystal. The shrieking blizzard produces a different picture as masses of powdery snow swirl into smoking crests creating drifts of solid whiteness. In the quiet of the soft snowfall all drab, familiar things are decked in costumes of spotless white as if in preparation for a beautiful masquerade.

Snow is eloquent in its silence and speaks as well as it covers. A walk through the woods when new snow lies smooth and even reveals all that occurs. If a squirrel visits his store house or a junco stops for lunch at a weed counter the fact is told.

Many story telling photographs can be taken by following footprints in soft snow. Early morning is the best time to work while the tracks are still fresh. The shadows are long at this time of day and by taking advantage of side and back lighting, striking results can be obtained. For this kind of work a tripod is required since exposures should be made at the smallest possible lens aperture. A filter is suggested for more dramatic effects.

It is surprising how soon you will find it possible to recognize a great variety of tracks and interpret their meaning. The footprints of skunks, squirrels, and mice are abundant. Those of the White-Footed mouse weave a curious design on the snow-blanket as they go around tree trunks and stumps and zig-zag along through open areas. Perhaps you learned that White-Foot's journey was a pleasure trip, or that he had been visiting one of his tree-trunk store houses, or that his hurried footsteps lead him home. Home to White-Foot is a cozy place in winter. Often he roofs a deserted bird nest with leaves and bark and resides within. Sometimes he lines an empty woodpecker's hole with grass and thistledown for his abode. If he finds a beehive available, he spends a comfortable winter with the bees. In addition to traveling on the surface, mice make hidden passages beneath the snow. Sometimes these avenues are near the surface and can be seen as slightly arched ridges.

When a squirrel journeys from his tree-trunk home he goes by a direct street of trees never crossing any more open space than will take him to his destination. Squirrel footprints are sharp and nervous reflecting the character of their nimble, frolicsome maker. Those of the red squirrel are smaller than the ones of the gray.

The skunk goes forth in a leisurely manner creeping about the woods and wayside in a deliberate fashion. No haste is indicated by his double nail-pointed prints which are closely spaced. He never hurries his step depending for protection upon his powers of producing his unpleasant scent.

The manner of motion of the muskrat leaves a clumsy snow-trail revealing indecision, timidity, and lack of purpose. It consists of frequent starts and stops, many ventures forward and slow retreats.

The sinister weasel makes a tiny trail of tracks, one following the other in so direct a line that they appear as the prints of one foot.

The sharp-rayed tracks of the partridge usually follow a strong line going beside stumps, over logs, through brush, and into densely tangled areas.

The quick, exact track of the fox conveys his cunning, agility, and resourcefulness. Easily you can read whether he has traveled slowly or in haste by the length of his stride.

A series of pictures depicting the signs in the snow are a valuable addition to the nature photographer's file as well as a pleasant winter project.

Coming Nature Exhibitions

Fifth Chicago at Chicago Natural History Museum. Feb. 1 through 28. Closed January 16. Prints and color slides.

Rochester at Rochester Memorial Art Gallery. March 3 through April 2. Deadline Feb. 10. Prints and color slides. Entry forms: David F. Adams, Memorial Art Gallery, Rochester 7, N. Y.

psa Camera Club

By H. J. Johnson, APSA
1614 West Adams St., Chicago 12, Ill.

CC Bulletins Competition

Club bulletins from 46 leading clubs in the U. S., Canada, Brazil, and Costa Rica were entered in the First Annual Bulletin Competition.

There were three classifications: (P) printed; (M) mimeographed or offset; and (H) hectographed or typewritten. These classifications were used to allow for the differences between resources of various size clubs.

Judges were Victor Scales, Hon. PSA, chairman of PSA Publications Committee, Fred Quellmalz, Jr., Hon. PSA, APSA, editor of PSA Journal, and George Rowan, of *The Camera* staff.

Content was considered as of more importance than appearance, with a total possible score of 65 points, distributed as follows:

25 points for interest and newsworthiness (editorial style; proportioning of gossip, etc., to other material; selection of subjects, etc.)

20 points for stimulation to participation in club activities (by exciting enthusiasm, building esprit d' corps, etc.)

20 points for service or usefulness to club (calendars of events; reports of meetings; standing of contestants; etc.)

Appearance could earn a maximum of 35 points, as follows:

20 points for layout (arrangement of text, illustrations, ads, etc.)
15 points for typography (neatness, legibility, accuracy, etc.)

Thus, with three judges, the highest possible score would be 300 points.

Three copies of each bulletin were entered, and one was furnished to each judge, who scored independently and returned the score sheets to us for final tabulation. After tabulation, each editor received the score sheets for his bulletin for his information and guidance. (Of extra value were the written comments on each score sheet.)

In the "P" or printed classification, Long Beach (Calif.) Camera Guild's "Spotlight" was winner, with a total score of 259 points. It was a six page issue, the fifth and sixth pages being attached and folded in, rather than inserted separately as in some bulletins. Typography was especially neat.

Second place in the same classification went to "The Bulletin" of the University of California Photography Club, scoring 253 points. This was an eight page, illustrated issue, with very good quality reproductions.

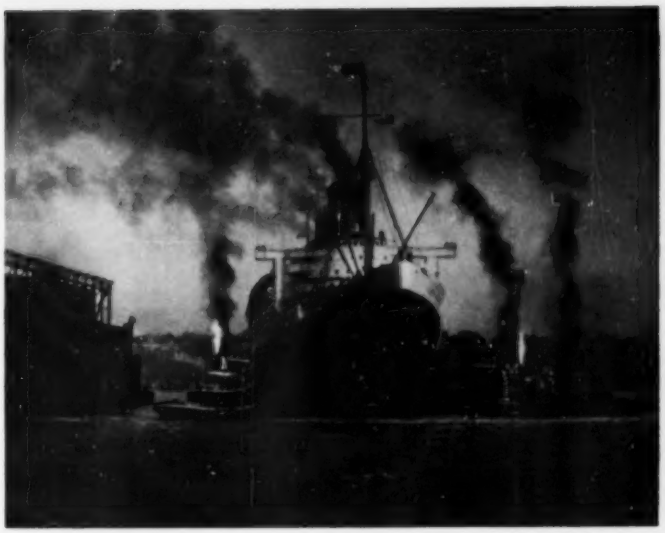
In the same classification, the editors of the following bulletins received ribbons for excellence in one or more of the components for content or typography: Gammagram (Sierra CC); Fotomic Facts (Buffalo Science Museum CC); Camera Club News (Atlanta CC); Photo Northwest (Washington Council); F. C. B. Boletim (Foto-Cine Clube Bandeirante, Brazil); Boletin (Club Fotografico de Costa Rica); Amacam (Manhattan CC); and Viewfinder (California CC).

In classification "M" (mimeographed or offset), highest scorer was Ft. Dearborn CC's "Fort Dearbornite," with 262 points. This was an eight page issue, offset reproduced, of which one judge said "I doubt that it cost nearly as much as more elaborate bulletins lacking in information."

Second place in this classification, with 260 points, was Cleveland Photographic Society's "Thru the Darkroom Door," four large pages, also offset. This particular issue had no illustrations, tho they are frequently used during the year.

Third, with 259 points, was Chicago Color Camera Club's "Projector," also offset, with six closely filled pages.

In this classification, the editors of the following also received ribbons for excellence in one or more of the components for content or typography: Honorable Mention (Green Briar CC); News Flashes (Chicago Cinema Club); News (Albany CC); Spectrum (Brooklyn Color CC); Notes (The Camera Club, N. Y.); Photo Gem (Toronto Y CC); Test Strip (Lincoln CC); Town Hall Crier (Town Hall CC); The Bulletin (Hawthorne CC); Panoram (Oakland CC); The Finder (National Photographic Society); Voice of the Lens (Stamford CC); Color News (San Francisco Photochromers); Photo News (Edison CC); Bulletin (El Camino); Close Up (Victoria CC, Canada); Bulletin (Nature CC); Hypo Check (Oklahoma CC); Contrast (Woodland CC); Hi-Lights (Johnstown CC); and Bulletin (Schenectady CC).



NUDGING THE QUEEN — J. H. Applegate

In class "H" (hectographed), winner was Ft. Madison CC's "Lensman," with 191 points. This issue was 12 pages, with photographic front and back covers.

So, at last, the editor has a way to obtain evaluation of his work, and recognition, just as the exhibitor obtains this help in the national exhibitions or competitions. A much larger number of entries is expected for the 1950 competition.

Club Print Competition

The first contest of the International Club Print Competition for 1949–50 was judged in Chicago, with details handled by the Ft. Dearborn club. More than 80 clubs were represented, including Cuba, Hawaii, Canal Zone, and Canada. (This is the largest number of participants in the history of the competition.)

Top club in Class A was Silhouette (Detroit), and Club Fotografico de Cuba was high scorer in Class B. Judges were H. J. Ensenberger, Nicholas Haz, FPSA, and Harry Langer, APSA.

Medals, instead of certificates, are being awarded to individual winners this season, and first to receive these were, in order: J. H. Applegate (Grosse Pointe CC); Jean Elwell (Silhouette CC); Albee Gulau (Silhouette CC); Angel DeMoya (Club Fotographico de Cuba); and H. K. Shigeta (Ft. Dearborn CC).

Highest ten clubs in class A were:

Silhouette CC	80 points
Channel City CC	78 points
Ft. Dearborn CC	72 points
St. Louis CC	72 points
Detroit Photographic Guild	68 points
Western Reserve Pictorialists	67 points
Queen City Pictorialists	61 points
Grosse Pointe CC	60 points
Houston CC	58 points
Buffalo Science Museum CC	58 points

In class B, the ten highest were:

Club Fotografico de Cuba	79 points
Jackson Park CC	73 points
Tulsa CC	65 points
Oakland CC	61 points
Albany CC	59 points
Spokane CC	58 points
Blackhawk CC	55 points
Phoenix CC	55 points
Bloomington (Ind.)	52 points
Utica CC	52 points

psa Color

By Karl A. Baumgaertel, APSA
353–31st Ave., San Francisco 21, Calif.

Baltimore 1950

One of the most difficult things in planning the program for a convention is deciding what the audiences would like to see. Equally difficult is to find new ideas. Convention audiences are usually quite articulate after it is over. We propose to give them an opportunity to be equally articulate before a convention as we believe that those who attend should be given a chance to say what they would like to see and hear and to help in the planning.

It should be explained that the Color Division will act only in an advisory capacity. The final decision on what is to be included in the program and the handling of program features, as well as the handling of the exhibitions held at such conventions, is up to the local convention committee. Any ideas or suggestions will be forwarded by the Color Division to the committee at Baltimore and will receive careful consideration. Where necessary we will furnish the committee with additional information and will cooperate fully with them in carrying out such ideas as may be accepted. With time rather limited it will

not be possible to follow all suggestions, so if your idea is not carried out it will probably be due to lack of time rather than to lack of merit.

One question most often asked is what makes an acceptable exhibition picture. Looking at an exhibition will not always give the answer. As a possible program item we believe a feature tentatively titled "Who's Who in Color Slide Photography" can do much to clarify the question. We propose to invite about 20 leading color slide exhibitors, carefully selected not only as to ability but as to geographical location so as to cover the whole country, to submit four or five slides each. We will secure the services of one or more leading exhibitors to comment on the slides submitted with accent being placed on what has made such pictures acceptable at exhibitions. At first glance this might be thought to be similar to the regular slide exhibition but the commentary by a qualified individual will give it value and interest all of its own.

Realizing that the value of exhibition pictures is often overstressed, they being the most glamorous part of picture making, we want to do something for those interested in other forms of color photography. One thing, not new but seldom if ever properly presented, is the making of travel pictures. As far back as October 1949 we asked one individual who is without doubt the country's leading exponent of this form of photography, besides being one of the top pictorial slide makers, to give a talk if she attends the Baltimore convention. It is yet too early to know what the answer will be.

Many people would like to see an actual judging. As slides submitted for the exhibitions must be judged prior it is not possible for many of the convention audiences to attend. Although it will be quite a problem it may, however, be possible to stage the actual judging of a Color Division Competition.

Through the efforts of H. J. Johnson, APSA, the Color Division has obtained slide sets from a number of foreign countries. At the time of writing we had sets from India and Canada and sets from Mexico, Holland and England to come. While such sets are circulated throughout the country, audiences are comparatively limited and it might give many more people a chance to see what is being done in other countries by showing one or two sets at the convention.

All of these features are in the idea stage. We mention them as they may suggest other things you may want to see. Send in your ideas whether or not you plan on attending.

There has been one more suggestion made by a number of people, that in order to insure the Color Slide Exhibition attaining the highest possible standards, the Color Division itself take over this activity in its entirety. One individual suggested that the color slide exhibition at the convention be placed in the hands of Bill Fuguet and Paul Wolf, who so very ably handled the New York Color Slide Exhibition last year. The suggestion was that all slides be sent to New York, judged there and the accepted slides then be taken to the convention and exhibited. This is a very nice compliment for two very deserving individuals, but unfortunately there are many reasons why this cannot be done. One is that a properly conducted color slide exhibition is a source of income. As the local committees handling conventions finance them, it would not be fair to deprive them of this income to offset some of their many expenses. Then such action would tend to show a lack of confidence on our part in the local committee; we have full confidence that Baltimore will do an excellent job.

If you have any suggestions please let us have them. Send them to your Chairman at the address shown at the head of this column. Send them irregardless of how elementary or how impossible or improbable they may seem. Then having sent your suggestions, plan how you are going to attend our greatest convention—Baltimore 1950.

Visit other Clubs

Back in the days of the Associated Camera Clubs of America, the predecessor to and founding father of the PSA, one of the points stressed was that any individual holding a membership card in any member club of the association would always be welcome to visit any other member club. In recent years this has been lost sight of although most of the old timers in the Society still follow the practice much to their own pleasure and to the satisfaction of the clubs visited.

With the exception of strictly business meetings, which are usually not interesting to a visitor anyway, most clubs welcome and encourage such visits. Your PSA membership card will gain you admission almost anywhere. Be sure and use it. To find such clubs the May Directory Issue of PSA JOURNAL will be found most useful. Other contacts can often be made through photographic dealers in the cities and towns you visit. If you are a color slide worker take some slides with you, about 25 will be enough, just in case you should be asked. It's best to wait until you are asked but if the opportunity presents itself you might mention, if you can do so gracefully, that you have slides with you, making sure, however, that the slides are worth while showing. Last but not least express your thanks to your host and say something complimentary even if you do think no other club compares with your home town camera club. You may be prejudiced you know.

Exhibition Slide Sets

As the fastest growing interest in Color Division activities has been in connection with our Exhibition Slide Sets, a great deal of effort is being made to expand this service to clubs and individual members. It gives us pleasure to announce that George Blaha has now taken over the supervision and is working on at least five new sets some of which will probably be in service when this appears. Charles Kinsley has also completed two new sets and Al Klein has been working on educational sets. Merle Ewell has also been busy. To arrange for sets contact the nearest distribution point as listed in the Color Division column in the October 1949 JOURNAL. Note one change: Kinsley's zone in Rochester is "17." If you can't find your October JOURNAL write your chairman and he will forward your request to the proper point. Exhibition Slide Sets do not include the foreign ones which are handled separately by Frank Bayless at 320 Cowell Ave., Oil City, Pennsylvania.

Canada 2¢

Having laid ourselves wide open to such suggestions, we feel it may be best for us to mention that we do know that the United States postage on post cards to Canada is two cents, and we will bring this to the attention of the next PSA exhibition committee as well as to others holding exhibitions so that notices of acceptances and rejections will reach their destinations in Canada promptly.

Coming Color Exhibitions

6th Toronto, Royal Ontario Museum Theatre, Feb. 27–Mar. 1. Deadline Feb. 4. Four slides, $1. Forms from W. J. Blackhall, Toronto Camera Club, 2 Gould St., Toronto 2, Ont., Canada.

Philadelphia, Mar. 4–20. Deadline Feb. 6. Four slides, $1. Forms from Chantry W. Davis, 346 Penn Sheraton Hotel, 39th and Chestnut St., Philadelphia 1, Pa.

Rochester, at Rochester Memorial Art Gallery, Mar. 3–25. Deadline, Feb. 10. Four slides or color prints, $1. Forms from David F. Adams, Memorial Art Gallery, Rochester 7, N. Y.

6th San Francisco, San Francisco Museum of Art, March 11–18. Deadline Feb. 25. Four slides, $1. Forms: Walter Sullivan, 351 Turk St., San Francisco 2, Calif.

Pittsburgh, Academy of Science and Art, Mar. 17–Apr. 16. Deadline, March 1. Four slides, $1. Forms from Karl Leach, 92 Estella Ave., Pittsburg 11, Pa.

Southgate, England, April 17–29. Four slides, $1. Deadline March 11. Forms from W. J. Linbird, 2 Dennis Parade, Southgate, N. 14, England.

El Camino, April 25–May 6. Deadline Apr. 3. Four slides, $1. Forms: Floyd L. Norgaard, 206 S. Lake St., Los Angeles 4, Calif.

psa Technical

BY VERA WILSON
343 State St., Rochester 4, N. Y.

Cleveland Section

Chairman R. C. Hakanson reports high interest in a recent Section meeting wherein two "home-town" experts discussed and demonstrated "A New High-Efficiency Flashtube for Low-Voltage Portable Power Packs."

Edward B. Noel, APSA, and Paul B. Davis, both from General Electric's Lamp Development Laboratory at Nela Park, did the job.

The new tube is the FT-110. It has a 100 watt-second rating. Its flash equals in photographic effect a No. 5 flashbulb at a shutter speed of 1/400th second although with it the exposure time is about 1/5000th second. The output is

suitable in color temperature for color photography.

Along with the new flashtube and its characteristics there was an explanation of the accepted method of judging light output and effectiveness. This knowledge is a "must" for every user and purchaser of high-speed flash equipment.

"Processing Ansco Color" was the December topic. H. G. Morse, of the Product Specifications Department of Ansco, was the speaker.

Rochester Section

There was popular—as well as technical—interest in the January 22 meeting featuring "Unusual Uses of Photography."

The program listed a talk on "Tropical Photography" by Dr. Walter Clark, head of the Black-and-White Photography Department of Kodak Research Laboratories; "Underwater Photography" by C. O. D. Iselin, Woods Hole Oceanographic Institution; an illustrated talk on "The Photography of Missiles" by a speaker from the U. S. Navy's photographic section; "Photography in the Antarctic," by C. Shirley, chief photographic officer on Admiral Byrd's recent Antarctic expedition.

William F. Swann, vice-chairman of the Technical Division, was a principal speaker November 29th before the Annual Industrial Electric Exposition in Pittsburgh. His talk summarized the uses and advantages of "Industrial Photography." He is with the Industrial Photographic Sales Division of Eastman Kodak. His part of the program also featured the showing of Kodak's new color sound film, "Functional Photography in Industry."

New York Section

Advances in the art of making photographic lenses during the past decade were outlined by Dr. Frank G. Back, of Zoomar Corporation (a research and development laboratory in New York City), for members of the New York Technical Section recently.

Four important developments have helped to make this progress possible, he said. They are: new and better optical glasses; anti-reflection lens coatings; new methods of lens computation; and, new and improved optical machinery.

Until fairly recently, Dr. Back reminded the New York members, it was almost impossible to produce a high-speed lens that was accurately corrected. Limited optical materials and techniques made it impossible to attain high speed and high quality at the same time.

This was due to two fundamental reasons:

First, to obtain good definition in the central portion of an image, the lens must be corrected for zonal spherical aberration and for longitudinal color. Second, to obtain good image quality toward the outer edges of the field, the lens must be corrected for astigmatism, flatness of field, and coma.

Until relatively recently, he pointed out, it was impossible to make both of these classes of corrections satisfactorily at the same time. "We had lenses of the Petzval type which have good resolution in the center, but suffer from field curvature and therefore are usable only for very small field angles, and we had lenses of the Cooke triplet type, which, while providing a flat field, also have strong zonal spherical aberration."

Today, due to the anti-reflection coatings, multiple elements can be used in a lens without impairing its light transmission qualities and thus its speed. Similarly, due to the new and improved optical glasses, which can be used in combination to produce inverted lens elements, it is now possible to obtain a low dispersion and a high refractive index with a minimum of astigmatism.

"Oddly enough," concluded Dr. Black, "these great strides in lens-making progress have come about simultaneously with the shift of the photographic center of the world from the eastern to the western hemisphere. . . . The new American glasses are not only available in greater variety, but in better constancy as to formula and to optical characteristics."

Membership Folder

A new folder, just off the press, outlines the work of the PSA . . . and each of its divisions.

It contains an application for membership, and is available singly or in quantity from Charles W. Seager of Ansco, Binghamton, or from PSA Headquarters in Philadelphia.

As membership chairman of the Technical Division, Mr. Seager stresses the various benefits to be derived by affiliating with the Technical Division. They are listed thus in the folder:

Publications: Technical Bulletin, occasionally. Special articles in the PSA JOURNAL. Quarterly technical supplements.

Meetings: Annual and 50 Section meetings yearly.

Lectures: At meetings. Speakers service.

Honors and Awards: Special awards under development. Divisional Honors Committee assists Society's Honors Committee.

Exhibitions: At meetings. Travel shows available throughout the year.

Contacts: With ASA, SMPE, and technologists.

Other Services: Local Sections in Rochester (1935); Binghamton (1941); Cleveland (1941); New York (1946); Boston (1947); Southern California (1947). Aids organizations of new Sections. Standardization in PSA and on national and international levels. Research. Exchange of data. General services to photographic technologists. Promotes science of photography. Disseminates photographic knowledge. Furthers education in photography.

MID-WEST PSA REGIONAL CONVENTION

Plan now to attend the PSA Mid-West Regional Convention to be held in Chicago on April 14, 15, and 16. The high point of the convention will be a lecture and demonstration by the inimitable "Pops" Whitesell on Saturday afternoon, April 15.

Other programs (details to be announced later) will be sponsored by various PSA Divisions.

A banquet on Saturday night plus a choice of Field Trips on Sunday will climax the three-day meeting.

For a grand time with your fellow photographers, "Come to Chicago."

TERRITORIAL COLUMNS

South and Southwest

By C. L. Herold
3601 Tangley Rd., Houston 5, Texas

Unbeknownst to most of us north of the Rio Grande, the Club Fotografico de México, our PSA affiliate in Mexico City, has been doing things in a big way. Through the kind cooperation of Juan Gutierrez, president of the CFM, we are able to bring the record up to date, and every effort will be made to keep it current.

Probably the main item of interest is the two-story building at 446 Ave. Insurgentes, the headquarters of the Club Fotografico de México. This is undoubtedly one of the finest club headquarters anywhere, as witness the following layout: a large studio fully equipped with lights, and cameras up through 8 x 10"; a darkroom for film processing; four darkrooms with enlargers from 35mm through 8 x 10"; a color processing room with all necessary equipment (densitometers, etc.); a work room for retouching, spotting, and mounting; a reading room and library; and a projection room seating 50 people. And, not forgetting that photographers the world over are a sociable (and hungry) group, the CFM has a bar and dining room on a glass enclosed terrace. Around the whole building are panels permitting the display of 300 prints on 16 x 20" mounts.

The CFM has a monthly publication, or *Boletin*, consisting of 20 to 26 pages on "slick" paper in a format of about 7 x 9". On the cover is a reproduction of the winning print of the previous month's competition, and three or four other prints are reproduced inside. Regular features of the *Boletin* include a full page editorial by the president, several technical articles, a ciné section, a question and answer department, and a criticism of the illustration on the front cover (the critic's *nom de plume* is "f/7.7"), and several others. It is indeed an excellent publication, and is really as much a photographic magazine as it is a club bulletin.

The CFM has a membership of about 240, about 80% of whom are doctors, engineers, or other professional men. An initiation fee of $50 and monthly dues of $10 ($6.50 and 1.20, respectively, in U. S. money) permit members to use the laboratories, to obtain free instruction from any of the 22 club instructors (mainly technical men from Eastman, Defender, Gevaert, *et al.*), and to use the bar and dining room.

Judging from the prints appearing in the *Boletin* during the past year, the CFM has more than just a fine building and publication to its credit—its membership

includes some very fine photographers and pictorialists, which, after all, are very important factors. Quite obviously any organization such as the CFM does not exist just because a group of people got together and thought it would be a good idea to have a club. It takes the hard work of capable, unselfish men who have vision and the ability to organize. Word coming from Gordon C. Abbott, FPSA, of Taxco (an Honorary Member and Counselor of the CFM), informs us that the man largely responsible for the growth and success of the club is its current president, Juan Gutierrez, an engineer. Besides being the man behind the CFM success, Gutierrez is an excellent pictorialist, and recently received the Medal of Photographic Merit from the RPS of England. Dr. Roberto Rojo is vice-president, Juan Mata secretary, and Jose Turu treasurer, to mention only a few of the officers.

In a determined and sincere effort to improve the quality of its prints and to obtain a broader viewpoint, as well as fresh criticism of its work, the Tulsa CC has adopted a plan which, although not wholly new, is an excellent one and certainly an "across the board" venture. *All* TCC print competitions are sent out of town under the direction of Joe Kennedy for judging and criticism by competent individuals, juries of prominent camera clubs, national photographic magazines, or other qualified groups. Tackling the matter from another angle, the TCC has a committee (headed by Frank Heller, who, incidentally, is now a PSA Three-star Exhibitor) which solicits prints for national contests and tends to all the details of submittal. From your editor's knowledge of TCC's work, backed up by the listing of numerous salon acceptances in *The Groundglass*, the quality of the TCC output is already high. Therefore, their plan is even more commendable.

Most of us are familiar with the work of J. M. Endres—particularly some of his recent genre studies—but here is an interesting sidelight on the man. In order to stimulate interest in salon exhibition amongst his fellow members of the Jackson (Miss.) Photographic Society, Endres awards plaques to the members who have the first print and color slide accepted each year in a recognized salon. C. Jerry Derbes won the 1949 silver plaque for a print acceptance (this print also won a PSA Bronze Medal—Pictorial Portfolio #63), and Charles Saums received the gold award for his color slide acceptance. JPS is indeed fortunate to have a member such as Endres.

The Shell Oil Company (Houston, Texas) CC's affiliation with the PSA is prominently and proudly displayed at the head of each issue of *The Safelight*. And well it might, for this young and relatively small club is just about the "PSA'est" outfit we know of. Here are some of the activities in which the SOCCC is now engaged: 1. PSA CC Print Circuit; 2. PSA CC Color Slide Circuit; 3. PSA International Print Competition; and 4. PSA International Color Slide Competition! In addition, there will be precious few prints travelling on the road under PSA sponsorship that won't eventually have a SOCCC sticker on the back. On top of this, numerous other national travelling shows of prints, slides, and movies are exhibited. Geo. P. Box is president, and Guy C Zingery is program director. One of the busiest fellows in SOCCC is Sam Davis, the PSA representative, as one would guess.

By the time this goes to press, we sincerely hope that John Hendricks of the Baton Rouge (La.) CC has forgotten all about Room 215 of the BR General Hospital where he had a long stay, and that he has shaken off all effects of the reason why he was there. You know, when one is laid up for a long stretch, there is nothing so refreshing as to have someone walk into your room who smells of hypo—or even sodium sulfide—instead of ether and other odors associated with hospitals. The talk that ensues can go a long way to getting a patient's mind off of his aches and pains. (Your editor can vouch for this on basis of a fairly recent experience.) Keep it in mind next time one of the boys is laid up.

psa New England

By Newell Green, APSA
64 Girard Ave., Hartford 5, Conn.

It's really cooking on the front burner this season, and we mean the Inter-Club Print Contest of the New England Council of CC's. Eighteen clubs sent in entries for the Fall Competition and that's the largest number ever represented since the contest started five years ago. It is a pleasure to see more and more taking advantage of it.

The NECCC Print Contest is managed especially to give the smaller clubs around New England a chance to compete with each other, and a good natured rivalry has sprung up between them. There are three competitions during the season, Fall, Winter and Spring, and each club enters four prints in each one. Prints are judged and scored in rotation by the half-a-dozen larger clubs in the Council which are ineligible to enter the contest.

The Fall Competition this season was judged by five members of the Springfield (Mass.) Photographic Society, and by a strange coincidence which occasioned a little eyebrow-raising among the other contestants, it was the Co-Ed CC, also of Springfield, which won hands down with a high score of 79 points. However, our scouts report there wasn't a trace of favoritism and that the Co-Ed really had the pictures. Second place was a tie at 69 points between the Bennington (Vt.) CC and the Armchair Photographic Society, of Stamford, Conn. Third went to the Wells CC, of Boston, with 66. Most surprising thing about this first round was the way it jumbled the usual standings. Wells and the Co-Ed were low clubs last year, while some of the top scorers of previous seasons were way down the list this time. Well, that ought to make it interesting for the remaining contests, just the way it does when the Yankees don't win.

There was a tie for the highest score on individual prints with 23 points going both to "Stake Dance" by H. W. Wagner, APSA, of the Norton CC, in Worcester, Mass., and "Lift Up My Soul'" by Earl Shepard of the Co-Ed CC. Second at 22 points went to "The Way Home" by Reuben M. Greene, of Bennington, and third with 21 to "Marriage" by Norton, of the Hopedale (Mass.) CC. The five members of the Springfield PS who judged the contest were: Louis Hinckley, Herbert Poirier, Douglas Wanser, Andrew Weilkeiwicks and Robert Wiles.

Membership in the New England Council of CC's is open to any camera club in New England and your correspondent will welcome inquiries about joining.

The Armchair Photographic Society, of Stamford, mentioned above is one of the newer members of the NECCC and has what is probably the smallest membership of any club in the Council—only six! It is sort of a club within a club. All are members of a large group, the Stamford CC, but feeling the need of intimate get-togethers for the exchange of ideas and mutual assistance these six formed the Armchair PS. They meet around at their homes and spend the evenings going over prints and having a "bull session" on photography in general.

"The Viewfinder" will never be quite the same again because it can never carry another "Pop's Corner." That always was a page one feature of this excellent publication of the Everett (Mass.) CC, but the man who wrote it, George "Pop" Warner, has left us. The news of his passing early in December has saddened all of us, those who knew him personally, and those who knew him through his column and the reports of others. Something will always be missing because it was in "Pop's Corner" that he carried on the famous and good natured slugging match with Ray LeBlanc, of Hartford and Editor of the Connecticut Valley CC "Bulletin," as to which one was the champion non-stop "sounder-offer" of the camera clubs. The rest of us got a big kick out of the cracks and passes the boys made at each other, and looked forward to another round every time the bulletins came out. It is sad that the match has to end this way, yet sadder still is the loss to photography. Pop Warner was a professional from way back whose hobby was helping the amateur. He was a moving spirit in the Everett CC, where they depended on him for advice, and he gave hours and hours of his time to speaking and demonstrations before clubs around Boston. His good humor and lively personality was always a bright spot in any gathering and he will be sorely missed for a long while to come.

The Springfield PS decided it would be a good idea to learn about animal photography at first hand, so for the first meeting in December it presented Herbert J. Knobloch, who is Associate in Charge of the Educational Department of the New York Zoological Society (better known as the Bronx Zoo!). Mr. Knobloch ran off several films which showed sequences of

BYRON H. CHATTO

Byron H. Chatto, Hon. PSA, age 68, died November 4 at his home at 1300 Milton Ave., Pittsburgh, Penna., after a few days illness.

Born in Surry, Maine, he was a graduate of the University of Maine in Electrical Engineering in 1905. He was employed for 20 years as a design engineer and for 16 years as Director of Photography at the East Pittsburgh Works of the Westinghouse Electric Corporation.

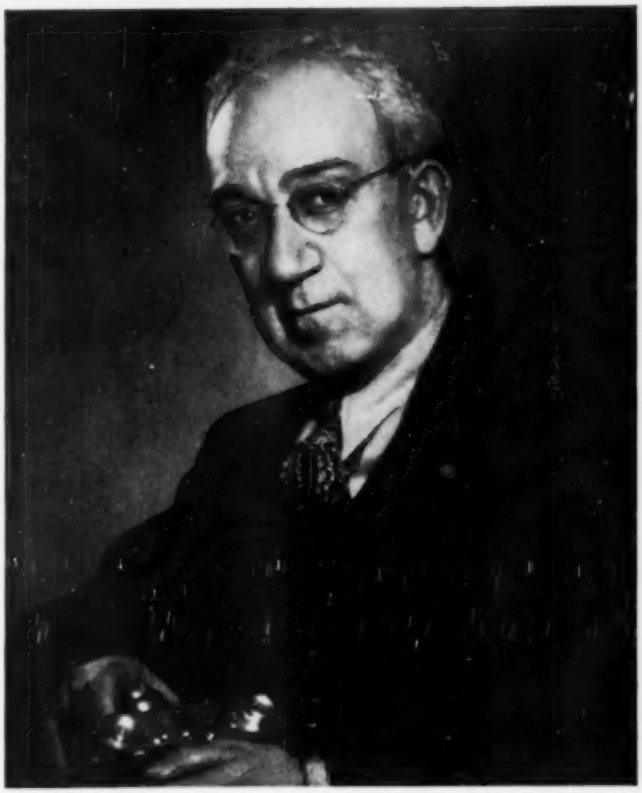
A founder and charter member of PSA, he served as its first Secretary for six years and started the PSA JOURNAL in March 1935, performing the duties of Editor and Manager for the first year. His ability as an organizer is well known to all early members of PSA.

He was elected an Honorary Member of PSA in 1939. He served for five years as a member of the first Honors Committee and was chairman for one year.

He was Secretary of the Pittsburgh Salon of Photographic Art for six years and has been Secretary of the Academy of Science and Art of Pittsburgh since 1934. Mr. Chatto was a frequent salon exhibitor since 1918 and was an Associate of the Pittsburgh Salon, the Camera Pictorialists of Los Angeles, and the Kodak Camera Club of Rochester, N. Y. He served on many salon juries and was a frequent author of articles in photographic magazines, especially PSA JOURNAL.

At the time of his death he was retired from Westinghouse but his time was well occupied with outside activities in photography. He leaves his widow, Mrs. Frances M. Chatto, and a daughter, Doris, at home.

To Byron Chatto, PSA owes much. The art of photography which he so ably served will be sorely pressed to replace him.



BYRON H. CHATTO — W. O. Breckon

pandas, monkeys, hummingbirds in slow motion and tigers, and a large audience thoroughly enjoyed them.

The Wells CC and the "Y" CC, both of Boston, had such a good time getting together for the annual inter-club print contest in October that they decided to join forces for a huge Christmas party. There was the usual program of games, stunts, music, dancing, a skit by the Wells Players, "Is There Really a Santa Clause?" and another by the "Y" CC Stock Company, "Willie Gets His Pitcher Took," and, of course, all ending with refreshments. But what interested us was the "Admission Fee." Instead of the usual exchange of knick knacks from the five and dime, which may be funny the first year, but begins to pall on repetition, the clubs picked out a needy but deserving family with seven children. Everyone attending was asked to bring an inexpensive toy or article of clothing for this family. In addition, they had to have "tickets" consisting of two Swan Soap wrappers to go towards a CARE soap package for Europe. It all made for a little of the real Christmas spirit along with their fun.

psa Canada

By REX FROST
37 Bloor Street, West, Toronto, Ont.

With this issue that vibrant dispenser of photographic joie de vivre, Blossom Caron, APSA, takes a low gracious bow. Between raising a family of four, ministering to, and competing with her Linhof-Leica-wise husband Ray for salon honors, Blossom has found time to earn Associateships of the PSA and London's Royal—the only member of the fair sex in Canada to enjoy such a distinction. The famed Westmount man and wife team has made photographic history in Canada. They live in a lovely home, which was built around a studio and darkroom in the shadow of Mount Royal. The PSA JOURNAL will miss that penetrating feminine literary sparkle. If Blossom responds literally to every glass that Canadian camera fans will raise toasting her performance, she'd better make it ginger ale or order a big supply of Bromo.

Read Johnny Appleseed
Page 21

Canada was admirably represented at the St. Louis PSA Convention. Color Photographic Association's virile President, Sam Vogan of Toronto, Canada's top ranking color slide exhibitor, was on deck, of course, and ably supported by Wes and Alice Stark, whom we notice from the 1949 catalogues are giving Sam heavy pursuit for salon distinctions. Mrs. W. R. Stevens, of C.P.A.C. Movie Division Toronto, and Stan and Muriel Barrett of Hamilton added a further color note. Port Dover's Harry Waddle, breezy past President of Hamilton CC, and Canada's star monochrome showman in 1949, had the thrill of seeing all four of his prints hanging in the St. Louis Art Museum. Harry was one of the five pictorial print entrants to win the PSA Salon judges' nod 100 per cent — and the only Canadian. Stan Daikin from our Pacific province, who's all hepped on the idea of setting up a Canadian Territorial Division of PSA, flew in from Nanaimo, B. C. From all accounts, everyone in the party had a marvellous time. Already they're chanting "Off to Baltimore."

Five years ago somebody suggested that the Port Colborne CC organize a full scale international salon. Certain gloom prophets said it couldn't be done adequately by a

PSA Technical Supplement

By F. E. Carlson, APSA, *Chairman*, Technical Division

Attached to this issue of PSA Journal is a new supplement entitled

Photographic Science and Technique.

The papers and information appearing between the covers of this and succeeding issues are directed toward those who are interested in scientific and technical photography and in the technological aspects of the photographic process and related equipment.

We of the Technical Division appreciate that the majority of the members of PSA are interested primarily in the taking, exhibiting, and viewing of pictures and have only a secondary interest in the technical phases of photography. At the same time, however, there is an increasing number of persons who are either using photography as a tool for scientific and industrial research or are working on improved photographic materials, equipment or methods. Published reports of their works stimulate the efforts of others and result in greater progress which is so essential to the future of photography. In the past only a few of these papers have appeared in the PSA Journal; the majority have been scattered in several other publications.

Each of us, regardless of the type of photography in which we are interested, is a direct beneficiary of the progress which is the inevitable result of technical and scientific achievement. Therefore, not only for the benefit of all, but also in order to strengthen the PSA as a whole, it is very important to provide an adequate medium for publishing technical papers. It is hoped that *Photographic Science and Technique* will accomplish this aim and, at the same time, increase the usefulness of PSA Journal to the majority of the membership of PSA.

It is to the attainment of progress through free exchange of information that the Technical Division is dedicated. *Photographic Science and Technique* is a publication in which authors of technical papers and articles will feel their work is effectively presented and is available to all PSA members who might benefit from the information presented.

club of only eighteen members in a town of some 8,000 people. But it was done, and done well. Enthusiasm turned the scales. The Port Colborne boys have been doing it ever since. Last year they put on a show that challenged comparison with the big cities. Matched it with a slick, well illustrated catalogue, as attractive as most of the best, and lots better than the millrun. Port Colborne's Fifth International comes up April 8-15. Warning. Send only your very best prints!

Another club, small in membership but bright with ambition, is the North Western Ontario aggregation at Port Arthur. Mid-November they staged their Tenth Annual Exhibition. Hung 90 local prints, plus a representative feature exhibit invited from the Photo Club of Quebec, Toronto, Port Colborne and Winnipeg. Topped it off with a 28 page illustrated catalogue. As North Western's Nelson Merrifield says: "Not bad for a club of twenty members."

St. Catherines CC are now meeting in the Radio Station CKTB building. Took advantage of network facilities, so to speak, in November and December, when prints were shown from the Brantford CC and London, Ont. Photo Forum.

Thanks go out to several prominent American photographers who have been making generous gestures to Canadian clubs of late. For instance, David Stanley, of Buffalo, thrilled the Hamilton CC with a talk on print flashing for tone control. Another spirited Buffalonian, Hugo Koeniger, has addressed Toronto, Port Colborne and the Camera Guild of Hamilton. Rochester's distinguished Arthur Underwood recently highlighted a special Toronto CC meeting.

Sixty-two years young Toronto CC has become air minded. Held a club meeting aboard a chartered Trans Canada Airways North Star for a birdseye club project over Niagara Falls. Then at a December get-together, invited the air officials to join in a Christmas cheer and thank you party. Toronto's Sixth Color Slide Exhibition will be screened February 27-28-March 1. Their 58th International, North America's oldest, is slated for May 1-15.

In the October Journal a cordial appreciation was voiced R. F. Bliss for his excellent photographic work with underprivileged and delinquent boys in Montreal. By a slip of the phrase, Bob's membership was credited to Hamilton CC. Should have been Montreal Amateur Photographers Club. Right now Bob is in Halifax, N. S. helping the Photo Pictorialists in the Maritime city do a similar humanitarian job.

Speaking of humanitarian jobs, Jim McVie of the Victoria B. C. Club is sending all his discarded proofs and prints to the Nanaimo Indian hospital. Urges other club members to do the same. Explains a group of sick youngsters keep scrap books there and amuse themselves colouring the prints. Incidentally, PSAer McVie has now merited his two star award — 80 salon acceptances of 18 prints.

It might also be said that B.C.'s new Westminster print chairman, Matt McEwan, has a soul. Better in this instance make it, 'sole.' Matt recently chose for the club's Monday night photo project the subject, shoes. Am wondering, did anyone have a Hartt?!

Saskatoon CC made a wise decision recently . . . to affiliate with PSA. Just a liberal expression of that dashing western spirit for which the prairie country is famous.

President Benoit of the Photo Club, Quebec, explodes a bit of human strategy in the "Bulletin." Of a meeting he writes: "Nous pouvons vous dire qu'à la dernière, nous avons eu comme modèel UNE JEUNE FILLE qui se prêta à toutes nos exigences et sut remplir sa tâche de modèle avec satisfaction." Then he promises more of the same feminine modelling allurement for future meetings. Obviously he understands the philosophy of getting the boys out to meetings. English speaking Canucks too, speak of it as "savoir faire."

Dr. L. J. Notkin of Montreal CC won third prize at the American Physicians Art Association in Atlantic City. Followed this by earning an Hon. Mention at the Canadian Physicians Art Association.

Cyril Smith of Dartmouth, N. S., nature slide specialist was in Montreal a short time ago on business. Made a point of dropping in on the Carons, and visiting Montreal CC . . . which is the friendly thing to do when travelling.

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Beginners: Have you read page 21?

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Open to individual members, free of charge. Limit 25 words each. Copy closes the tenth of the second preceding month before publication.

For Sale—Complete file of PSA Journals, from Vol. 1 #1 to current issue. Fine condition, not bound. Ray Miess, 1800 N. Farwell Ave., Milwaukee 2, Wisconsin.

For Sale—Korelle Reflex II, slow speeds, 8cm f/2.8 Tessar, 82B adapter, case $125.00. Rolleicord latest, f/3.5, case $100.00. Rothschild, 84 Bay 25th St., Brooklyn 14, N. Y.

For Sale—Cine special 16mm, model 2, f/1.4, Ektar lens, 100 ft. chamber, mask set, one owner, $800.00. Kodak reels and cans, 16mm, 400 ft., used once, 85¢ reel and can, have 100. Jimmie Wallace, 2220 Wrocklage Ave., Louisville 5, Kentucky.

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2. A lump or thickening in the breast or elsewhere
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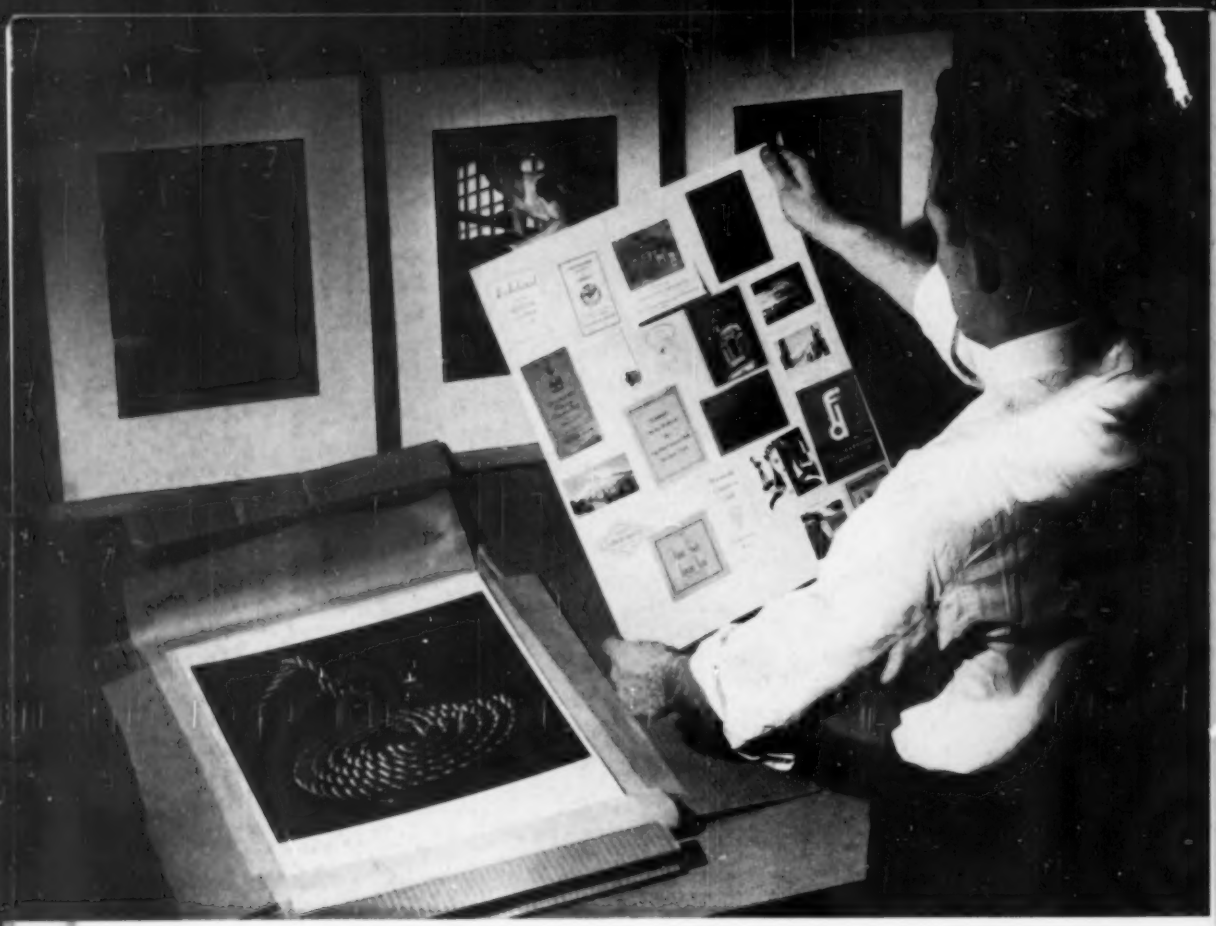

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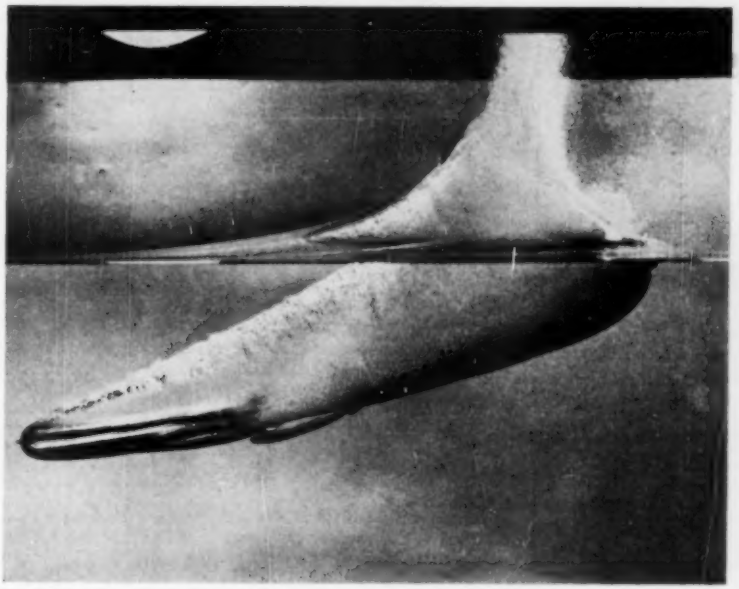

Torpedo Design Testing *U.S. Navy*

PART II to January PSA JOURNAL, Vol. 16, No. 1

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PHOTOGRAPHIC SCIENCE AND TECHNIQUE

A QUARTERLY TECHNICAL SUPPLEMENT TO PSA JOURNAL

VOLUME I JANUARY 1950 NUMBER 1

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FOREWORD

THIS FIRST issue of *Photographic Science and Technique* marks the significant beginning of a new era in the progress of the Photographic Society of America towards its avowed objective to serve photography as a medium for cooperative action in promoting the arts, applications and science of photography and for furthering education therein.

FOR THE first time in this country a national society is now in a position to make available a publication which is intended specifically for papers and articles dealing with the scientific and technical aspects of photography.

THE TECHNICAL Division of PSA is proud to have the opportunity to share in this significant step and has accepted the responsibility for providing a technical editor and staff to work in close cooperation with the Publications Committee of the Society and the editor of PSA JOURNAL. Each member of the editorial staff is outstandingly qualified to serve in his assigned capacity.

AN IMPRESSIVE list of papers is already available for publication. We must, however, look towards the future. We can confidently expect an increasing supply of scientific papers from the many photographic laboratories here and abroad as *Photographic Science and Technique* becomes better known and more widely read. In addition to these very important papers, it will be necessary to search out the potential authors of papers reporting new or improved techniques in the use of photographic methods not only in science and industry but in all fields of photography.

TO ACHIEVE the ultimate objective the editorial staff of the Technical Division will need the help of all members of PSA and the readers of *Photographic Science and Technique*.

FRANK E. CARLSON, APSA
Chairman, PSA Technical Division

Photography in Industry

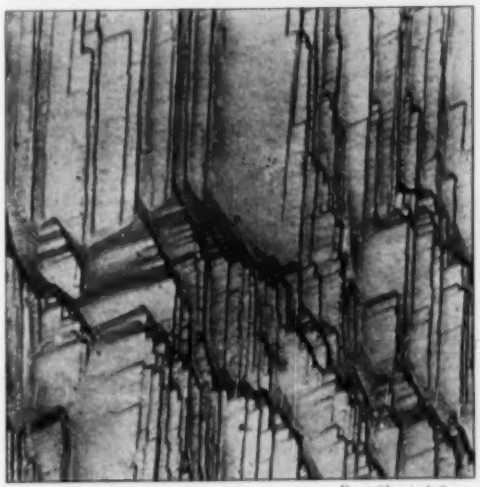
By WILLIAM F. SWANN*

PHOTOGRAPHY in industry, or more broadly, functional photography, accounts for more than two-thirds of the photographic materials used today. The other third is used by amateur photographers. It is not generally realized that photography plays such an important role in industry, science and business. For example, there are approximately 55,000 x-ray laboratories, 3000 photo departments in industry and 3500 graphic arts establishments in this country. These figures do not include thousands of commercial, portrait, photofinishing, newspapers and motion picture producing firms. Photography is being used more and more by industry as it proves its worth by increasing accuracy and speeding up industrial operations.

Photography is possible because certain silver salts are sensitive to light, both visible and invisible. Photography, from the Greek word meaning to draw with light, is the science of obtaining images of objects by the action of light on sensitive surfaces. Research has made it possible to sensitize silver emulsions so that they will not only record visible light, that is light to which the eye is sensitive, but will also record light to which the eye is not sensitive such as infrared, ultraviolet, x-rays, gamma rays and highly ionized particles mysterious to the field of nuclear physics. Because photography has supplied a relatively simple means of recording information, it has gained wide application to industrial problems. Photography has actually become a precise science, capable of supplying data as dependable as that obtained in other physical sciences such as chemistry and physics.

In order to discuss industrial photography, it is convenient to divide the many applications into three general groups: data recording, photo-analysis and photo-reproduction. Data recording might be regarded as the use of ordinary cameras for obtaining production data, the use of special camera techniques for recording data obtained from various types of instruments known as oscilloscopes, and the use of microfilming for space-saving filing of voluminous large scale records. A typical application of ordinary cameras is the photographing of instrument panels, meters and number counters.

*Eastman Kodak Co., Rochester 4, N. Y. Rewritten from a talk given before the 1948 PSA Convention, and various Technical Sections during 1949.

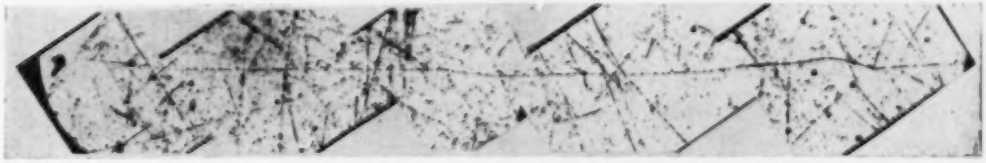


Dow Chemical Co.

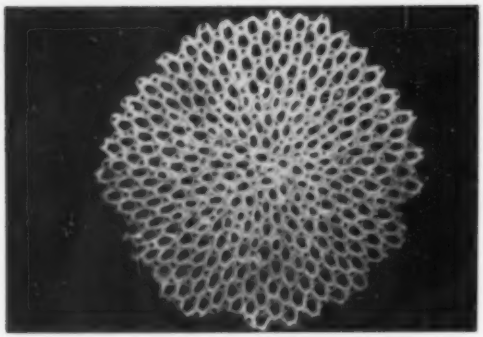
The electron microscope is being used widely in industry. This is an electron micrograph, X10,000, of magnesium aluminum alloy.

A more specialized application, but again using an ordinary camera and camera technique, is the estimation of the volume of pulpwood in stock piles, a job which formerly was done by actual measurement or rough estimation. The problem is to determine the volume of wood received on a flat car. By utilizing a high contrast photographic material the flat car full of wood is photographed. The spaces between the logs can be produced as black areas and the faces of the logs as white areas. A special photoelectric scanning machine is then used to evaluate the amount of light areas to the dark areas and assuming the length of the logs to be standard, a very accurate estimate of the total volume of wood can be obtained.

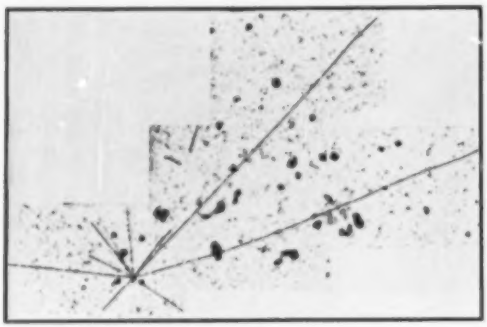
The widespread use of cathode-ray oscilloscopes necessitates methods of recording the patterns observed on the



The result of the exposure of an Eastman NTB emulsion to mesons in the University of California Cyclotron, a valuable aid in the field of nuclear physics.



An example of the use of photography in locating underwater oil deposits. This microscopic organism was found in the sand of the ocean between Florida and Cuba at a depth of 3000 feet. Photo by F. W. Rolshausen, Humble Oil & Refining Co.



Cosmic-ray star obtained by exposure of Eastman NTB plates at high altitude. Star corresponds to disintegration of heavy atom (Ag or Br) of photographic emulsion by high-energy cosmic-ray particle.

face of the cathode-ray tubes. Photography is the logical answer. In many cases standard cameras can be modified for this purpose, but in other cases specially designed cameras are required. Cameras from simple 35-mm still cameras to high speed 16-mm motion picture cameras are being used for this type of recording.

Mirror and string galvanometer oscillographs are true recording instruments. The oscilloscope and the camera are designed as a single unit. Electrical impulses actuate small galvanometers and the fluctuations of the galvanometers are recorded on a moving strip of paper or film. These instruments have wide application in the oil and aircraft industries.

Microfilming for space-saving filing is not a new application of photography. The system is used extensively in business for copying all kinds of legal documents, file cards, architectural plans, bank checks, shipping labels and waybills and, more recently, engineering drawings.

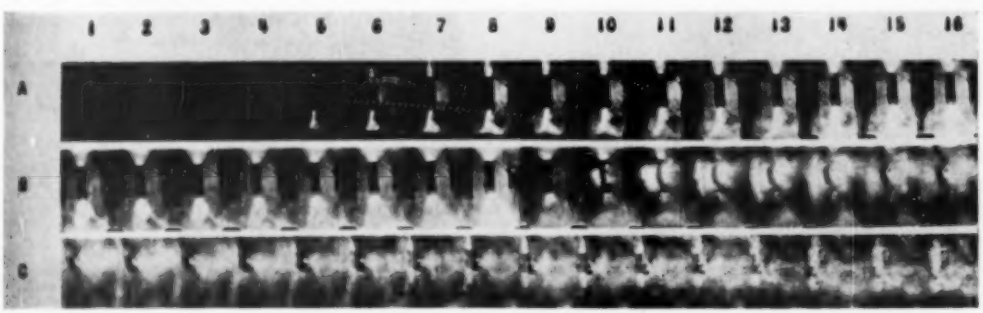
Photoanalysis is a term which can be used to indicate any application of photography for the purpose of obtaining data for use in analyzing the effects of various treatments on materials or the direct analysis of materials. Some of these applications probably are familiar. Photoelastic stress analysis is accomplished by making transparent plastic scale models of such things as gear teeth, rigid joints and girders. Polarized light is passed through the model and when the model is subjected to pressure or stretched, the strains and stresses produced in the model cause interference of the transmitted light beam and a definite pattern is formed which can be photographed and then interpreted mathematically to determine the suitability of the part for the job for which it is intended.

Photomicrography

Photomicrography is the use of a microscope to obtain photomicrographs at high magnification of a great variety of subjects. Almost every industrial plant uses photomicrography in one way or another. More recently color photomicrographs have been shown to be more valuable than black-and-white pictures for many applications.

The light microscope is capable of magnifications up to about two thousand times. A relatively new instrument, the electron microscope, is capable of magnifications up to about twenty thousand times. The electron miscroscope is similar in principle to the light miscroscope but a source of electrons is used rather than light. If light is regarded as a measuring stick having a definite length, the electron can be regarded as a measuring stick, also having a definite length, but considerably smaller than the light measuring stick. The electrons are, therefore, capable of measuring smaller things. The electron microscope is becoming increasingly more important in industry, especially in connection with the studies of abrasive materials, chemicals, plastics and structures of metals.

Industrial radiography is probably familiar as a technique



Shot of exploding firecracker, showing simultaneous rupture of side wall at two points, taken at 40,000 frames per second with the NACA high-speed camera.

for the examination of castings and machine parts. However, two other techniques involving the use of x-rays are probably not quite so familiar. The first is x-ray diffraction, a method for studying the internal or molecular structural materials, the identification of crystalling substance in mixture with another; and the second is microradiography, a contact radiograph of a thin section of metal or other material utilizing soft x-rays, which have the property of being able to penetrate only the surface layers of very thin sections of materials. The technique is applicable to the study of fiber structure and surface coatings.

Spectrographic Analysis

Spectrographic analysis is the study of light emitted from samples of materials burned under controlled conditions in either an arc or a spark. The light produced is passed through a prism or a grating and broken up into its component parts and photographed, producing a spectrogram. A complete chemical analysis can be obtained in a few minutes compared to several hours required by usual wet chemical methods. Obviously, this technique can be extremely important in production control.

Infrared photography has found some uses in industry primarily because of the nature of the invisible infrared rays. The best known use of this technique is for the photography of hot objects. Infrared techniques can be applied to studies of heat distribution in temperature bars, studies of heat absorption and reflection properties of metals. One of the most interesting applications has been in the study of audience reactions, where infrared pictures are taken in total darkness without the knowledge of the audience.

Going to the other end of the spectrum, ultraviolet photography is useful for identification of paints and inks, prospecting for certain minerals and in crime detection.

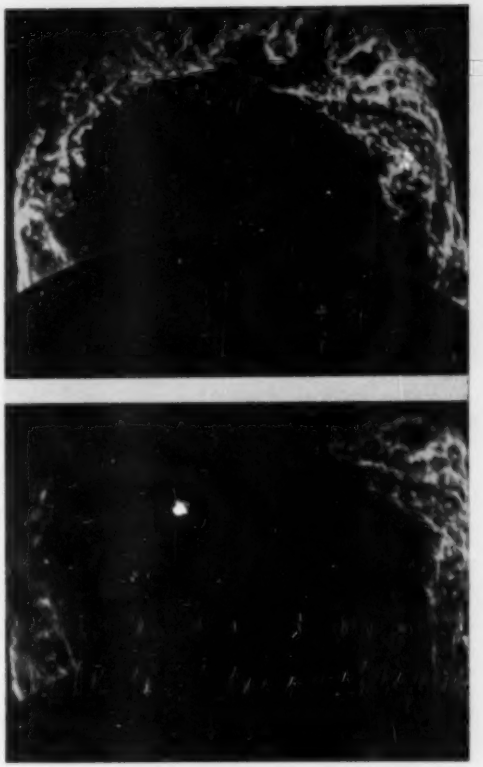
Fluorescent photography, which utilizes an ultraviolet light source to activate certain constituents in materials to produce a visible fluorescence, also has limited application.

High speed photography is used in many ways in industry and can be broken down roughly into three distinct types: motion pictures up to 8,000 frames per second with special high speed cameras; spark and shadowgraph photography, a technique using ordinary cameras and films in conjunction with high intensity flashes of short duration, and Schlieren photography, a technique for studying liquid or gaseous air currents usually invisible to the eye.

Astronomy can hardly be called photography in industry but the subject is worthy of mention because probably more special photographic materials are made for astronomical research than any other type of research. It is interesting to note, however, that about ten years ago the bulk of the special plates being manufactured were used by astronomers, but that now the majority are being used by industrial firms for special applications of photography.

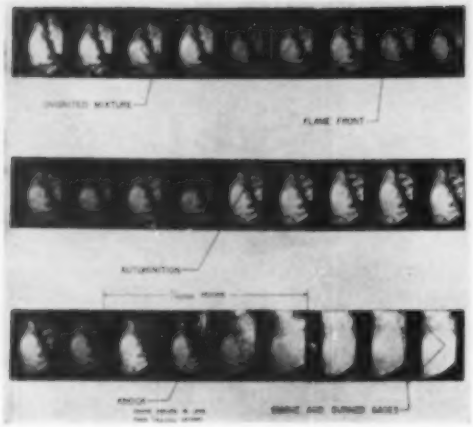
The Field of Nuclear Physics

Another field, formerly purely in the realm of science but fast becoming of industrial importance, is the field of nuclear physics. It is now possible to make photographic materials that will record the tracks of highly ionized particles, the actual building blocks of all matter. Some of the elementary particles of the atom are capable of forming tracks in photographic emulsions as they shoot through these emulsions. Advances in the production of plates for nuclear research have been really tremendous during the past two years. We do not know where this is leading us but it is becoming apparent that the physicists are catching



Photography is used extensively in astronomy. These photographs of the huge eruptive prominence of 4 June 1946, were taken by Dr. John W. Evans and Dr. Walter Orr Roberts with the coronagraph of the Hight Altitude Observatory of Harvard University and the University of Colorado. The bright face of the sun was artificially eclipsed in the coronagraph so that the huge cloud of prominence gas may be seen beyond the sun's edge.

Another use of photography in industry may be found in crime detection. Here, in this picture from the FBI, ultraviolet light is used to bring out laundry marks.



Photographs of engine knock, preceded by autoignition, taken at 40,000 frames per second with the NACA high-speed camera.

up very rapidly with the writers of such fantastic stories as Buck Rogers.

Even more recently the words autoradiography and radioautograph have begun to appear in the literature and in the news. An autoradiograph is a radiograph produced by radioactive material within a specimen. Extensive investigations in this field have become possible because of the availability through the Atomic Energy Commission of radioactive isotopes of elements. Most of the work at the present time seems to be in the medical and biological fields but there is some work going on in industry for the study of diffusion of elements such as sulfur in metal alloys.

The third group in the field of industrial photography is photo-reproduction, the duplication by photography of anything written, drawn, typed or printed, either for record purposes or as a means of disseminating information. Two processes used to a limited extent are worthy of mention. The first of these, which was formerly known as Linagraph Transfer or Matte Transfer Process, is now called the Kodagraph Projection Process. In this process the emulsion is supplied on paper in such form that the emulsion could be readily stripped from the support. In use the emulsion side of the paper is laminated, using an adhesive, to a sheet of metal or other material by a special machine called a laminator. The adhesive, upon drying, produces a stronger bond between the metal or other material than the bond between the emulsion and the paper base. The paper can then be stripped, leaving the emulsion on its new support. The process was used in the aircraft industry during the war for the production of metal templates. This eliminated a very large percentage of the re-drafting formerly required and consequently speeded up production. For example, in the design of large planes such as the B-29, the first model was completed within a matter of months instead of the usual time of two to three years. By this technique the approved drawing could be faithfully produced indefinitely on metal. The process is still being used to a limited extent.

The second reproduction method is the Transfax Process. Transfax, handled under ordinary room lights, is a photosensitive material which can be sprayed onto sheets of metal, plastic and other materials. The printing original should have high contrast to give the most satisfactory results. Exposure is made by contact with arc lights. Processing is relatively simple and involves a weak ammonia solution followed by a hot water spray. Transfax is suitable for the production of small quantities of instrument dials, name plates and wiring diagrams. Modifications of Transfax are being used on ceramics and glassware.

Photography, the science of drawing with light, is contributing its share to make our lives more pleasant and fruitful and is destined to play an even more important part in the future.

Light-Meter Uses with Electronic Flash†

By Harold E. Edgerton, FPSA*

Electronic flashtubes, commonly called speedlights or strobe lights, as well as chemical flash bulbs present a measurement problem because of the transient nature of the light. What is needed for flash photography is an integrated value of light vs. time—in other words, exposure. The common exposure meter as used for reading the continuous light cannot be used for evaluating the exposure from a flash.

A light meter of the integrating type is briefly described. The object of this article is to review the theory of operation of this meter and then to show how the meter can be used for measuring light and applying the results in photography, especially for color.

FIG. 1

Figure 1. A light integrating meter designed for use with xenon flashtubes.

†Delivered at PSA Convention, St. Louis, Mo., 20 October 1949.

*Massachusetts Institute of Technology, Cambridge, Massachusetts.

Theory of the Light Meter

As has been explained more fully in references 1 and 2, the light meter has a vacuum-type phototube operated at a fairly high voltage to insure that photo-electric current and light are proportional. This current is then used to charge an electrical capacitor. The increase in capacitor voltage will be proportional to the *integral* of the current with time. This produces a very useful result, namely, a voltage that is proportional to the *integral* of the *light* against time, in other words, *exposure*.

A photograph of a light meter of the type described above, manufactured by the General Radio Company, 275 Massachusetts Avenue, Cambridge 39, Massachusetts, is shown in Figure 1. The electrical circuit of a light meter is shown in Figure 2. On this simplified diagram are shown the phototube and the integrating capacitor as well as the vacuum-tube voltmeter that permits the measurement of the capacitor voltage without drawing appreciable current. It is this last item that makes the electronic exposure meter a practical device.

The switches shown in Figure 2 must be operated in the correct sequence to obtain proper performance. First the switch S_3 must be closed to discharge any charge that may reside in the integrating capacitor. With the switch S_3 closed, the zero adjustment is set to bring the indicating meter to zero.

If continuous light falls on the phototube with S_3 closed, current will flow proportional to the light. When the integrating circuit is made active by opening S_3, the capacitor voltage will increase steadily and the meter will drift upscale. This is an undesirable condition when a flash is being measured.

The General Radio Light Meter has a combination push-button switch which serves the functions of S_1, S_2, and S_3 in proper sequence and quickly so that the integrated current due to continuous light will not seriously effect the meter reading. The sequence is as follows: Initially S_3 and S_2 are closed, and S_1 is open, with a spring to hold the switch in this position. A push results in, first, the opening of S_3 which activates the integrating part of the circuit, second, the closing of S_2 which flashes the flashtube and, third, the opening of S_2 which disconnects the phototube. As long as the switch is held in this final position, the meter will hold its reading. The meter returns to zero when the push button is released.

Several items must be carefully considered in the design of an integrating type of light meter. For example, the meter must be capable of integrating for short intense flashes of light. The General Radio meter for example is useful down to about 20 microseconds before the error becomes excessive for photographic uses. Factors influencing the shortest flash that can be measured are discussed at some length in reference 2. A meter can be designed to operate at a microsecond duration or less if desired.

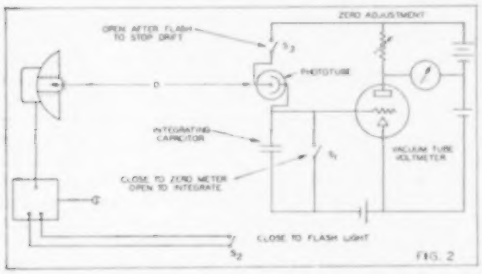


Figure 2. Elementary circuit diagram of an electronic light meter for integrating the radiation received from flashtubes.

The spectral sensitivity of the light meter corresponds to the spectral sensitivity curve of the photoelectric tube unless a compensating filter is used. With an unfiltered phototube, the meter can only be used for measuring the light from a source that has the same spectral distribution and the same color temperature as the calibrating light source. Light from a standard xenon-filled flashtube is ideal for calibration. Most modern xenon flashtubes emit the same color of light to a first degree of approximation. The General Radio meter uses an 1P39 phototube which has an S-4 surface which peaks in the blue at 4100 angstroms and cuts off at 7000.

The General Radio meter is calibrated directly in footcandle-seconds (lumen-seconds per square foot) of incident light from a xenon flashtube. A preliminary table of the required incident light at the subject in footcandle-seconds for various photographic materials accompanies this article. Check measurements of these data are now being made by various manufacturers and users of sensitive photographic materials and their recommendations will be published elsewhere when available. Until then, the preliminary data will serve as a rough guide for the initial use of the meter.

A Polaroid light attenuator is located on the front of the meter over the phototube. In this way the range of the meter can be increased by factors of 2, 4, 8, 16, 32, and 64. Corresponding values of f/-numbers are also marked on this dial for aid to the photographer when exposing color film, as will be explained later.

Measuring the Output of a Flashtube

One of the most important uses of the integrating light meter is the measurement of the output of flashtubes and associated equipment. Likewise the performance of the flashtubes in various reflectors can be determined.

The total light output of a flashtube under specified operating conditions requires a measuring system that integrates in space, all the light that is emitted. Such a measurement can be made by placing the tube in an integrating sphere of large size compared to the tube and arranging a light sensitive device that does not see the actual source but only the integrated light. This integrating-sphere technique is widely used by lamp manufacturing companies. However, it is a difficult method to use when only a few spot checks are necessary because of the amount and size of equipment required.

If the output is equal in all directions as with a spherical source, the total light flux can be calculated by measuring the incident light flux per unit area at a measured distance from the source in one direction and then multiplying this flux value by the area of a sphere having that radius. In this way, the total light flux from a spherical source can be determined, for example:

$$Q = 4\pi D^2 W \text{ lumen-seconds.}$$

where Q is the flashtube output in lumen-seconds.
D is the distance from the source to the light meter in feet.
W is the reading of the light meter in lumen-seconds per square foot (footcandle seconds) incident light.

Practical sources are *not* spherically symmetrical due to irregularities of the emitting element and to the tube base. It has been found experimentally that, with practical tubes of the helical types such as the General Electric Company FT-214, the factor 4π should be replaced by 10 when the

incident light is measured in a horizontal direction perpendicular to a vertical line through the tube base. Thus

$$Q = 10D^2W_h \text{ lumen-seconds}$$

where W_h is the reading of the meter in lumen-seconds per square foot in a horizontal direction perpendicular to the vertical axis of the flashtube.

The candlepower-seconds, CPS, output of a *symmetrical* spherical source is equal to

$$CPS = \frac{Q}{4\pi} = WD^2 \text{ candlepower seconds (by definition)}$$

Correspondingly for the *unsymmetrical* practical tube, the horizontal candlepower second, HCPS, output is

$$HCPS = \frac{Q}{10} = W_hD^2 \text{ horizontal candlepower seconds.}$$

The word horizontal signifies that the measured direction is horizontal and perpendicular to a vertical axis through the tube base. This concept of horizontal candlepower-second output is very useful since this portion of the light is usually directed by the reflector to the subject which is illuminated.

So far in this discussion, the tube has been considered to be placed in a large open space so that no reflections will influence the incident light, W, received by the meter. From a practical consideration, some care is necessary to keep the tube a distance from lightly-colored surfaces or from specular surfaces that might increase the received incident light at the meter. If it is impossible to isolate the tube from such surfaces, then absorbing materials such as black velvet cloth should be used to cover the surfaces. It is easy to find the error caused by various surfaces by comparing the meter readings when the surface in question is covered and not covered by a black velvet cloth.

Measuring the Output of a Flashtube in a Reflector

When a reflector is used with a flashtube, the meter reads the combined effect of the tube and the reflected output from the reflector. The purpose of a reflector is to gather the light and direct it upon the subject that is to be illuminated. In some cases the subject is small and at a great distance thus calling for a reflector that concentrates the light in a small angle. Again the reflector may be close to a large object requiring a wide angle for desired coverage.

Each type of reflector with a given tube at a specified position will distribute the light output in a characteristic manner. The light meter is useful in determining the light distribution.

Measurements of the output of tube-reflector combinations are usually made at a distance of at least ten times the diameter of the reflector, in order to avoid cross-over effects in the beam. From an experimental standpoint the light meter can measure the reflector performance at any distance if the reflector is to be used at that distance.

The output of a tube-reflector combination can be given in beam-candle-power-seconds, BCPS, on the center axis of the reflector where the light output is usually greatest. As before with a bare lamp, the

$$BCPS = W_hD^2$$

where W_h is the reading of the meter on the beam axis in lumen-seconds per square foot and
where D is the distance from the tube to the meter in feet.

The ability of a reflector to increase the output in the axial direction can be stated as the ratio of light with the reflector to that received without the reflector. This ratio can be called the reflector factor, M.

$$M = \frac{BCPS}{HCPS} = \frac{W_hD_h^2}{W_hD_h^2} = \frac{W_h}{W_h} \text{ if } D_h = D_h$$

Two meter readings are thus required to obtain the reflector factor experimentally.

A highly specular reflector may produce a distorted image of the light source in space. For this reason the meter may show large variations with slight changes in position with respect to the reflector. This non-uniformity of the light will show up if a photograph is taken of a bare wall. Many reflectors require a small amount of light diffusion to break up these patterns. Either a diffuse surface or a diffuser in front of the reflector can be used. The meter enables the reflector designer to measure the light variation in space and the loss of light resulting from the use of a diffusing means.

A large value of reflector factor is not usually desired since a large factor always means a *narrow beam*. Thus another factor is required to describe reflector performance which will bring in the beam spread.

The integrating light meter can be used to measure the beam-candlepower-second output for all angles for any given example and thus the entire performance can be determined. Irregularities due to the form and position of the flashtube can be plotted. Likewise the influence of diffusing screens and various reflector surfaces can be evaluated.

One arbitrary method of describing "beam spread" or "reflector angle" is to determine the angle between light rays that have a value of half of that of the light ray at the center of the beam. The "reflector angle" of the average reflector as used for light-on-the-camera-photography is about 40 degrees.

Flashtube Efficiency

Flashtube equipment designers and users are very much interested in the efficiency of existing and proposed flashtubes for the obvious reason that a more efficient tube means either additional useful output for a given equipment or a smaller equipment for the same overall result.

The electrical energy input to a flashtube can be calculated from the expression that gives the energy stored in the capacitor:

$$\text{Capacitor stored energy} = \frac{CE^2}{2} \text{ watt seconds where C is the capacitance in farads and E is the voltage in volts.}$$

Most of this energy is received by the flashtube under the usual operating conditions, and therefore efficiency calculations are usually made using the above equation for calculating the energy input to the flashtube.

The capacitance values as marked on commercial capacitors are only a nominal value. The actual value should be measured if accurate efficiency factors are to be obtained. Commercial tolerances of capacitance are often −0 to +15%. Therefore most of the capacitors will be larger than rated. The importance of this is realized when the difference between the efficiency of various flashtubes may be only 15%.

Likewise, the voltage must be accurately known especially since it enters the stored energy expression as the square. Comparison of two flashtubes of similar characteristics should be made with the same capacitor and the same voltage measuring equipment in order to cancel out as many errors as possible.

Standard flashtubes, whose efficiency is known at a given

voltage and capacity, are very useful in the laboratory. For example the average General Electric Company FT-214 flashed from 100 mf at 2000 volts gives an output of 625 horizontal candlepower seconds (6250 lumen seconds) at an efficiency of 31 lumens per watt. Individual tubes will have outputs that vary from this by about 10 per cent.

As has been explained before, the output from the flashtube can be determined with the light meter either with an integrating sphere or by reading the horizontal-candlepower seconds and multiplying it by the tube-meter distance squared and an appropriate factor such as ten for the conventional form of tube as used today.

Efficiency is then the ratio of output to input subject to the limitations previously stated.

$$\text{Efficiency} = \frac{\text{output}}{\text{input}} = \frac{WD^2\ 10}{CE^2/2} \text{ lumens per watt.}$$

The efficiency for each type of flashtube is a function of the capacitance used and the voltage to which it is charged. A complete chart can be presented of the efficiency as a function of these factors as shown for a typical tube in Figure 3.

There will be efficiency differences between individual flashtubes due to inherent differences in manufacture. Likewise each flashtube will lose efficiency with life as the electrode material sputters on the sides of the tube. All these variations are easily measured with the light meter.

The decrease in overall efficiency due to long interconnecting cables between the capacitors and flash tubes can be measured.

A casual study of the efficiency curves of Figure 3 indicates clearly that a flashtube should usually be loaded near the damage point if a high efficiency is to be attained. However, this is not always practicable since so many types would be needed. Furthermore a highly efficient tube might not have ample life.

Design of Electronic Flash Equipment

It has been shown (1) that the *guide factor* of a specific electronic flash unit is proportional to the square root of the light output Q and the reflector factor M. The guide factor is the product of the light-subject distance by the lens aperture for satisfactory exposure. Thus:

$$DA = \sqrt{KQM} = \text{guide factor}$$

where D is the lamp to subject distance in feet.

A is the relative aperture or f/-number

Q and M are total light output and reflector-factor as given before.

K is a constant which must be experimentally determined* for a suitable photographic result for each type of film. Table I gives approximate values for K for different sensitive materials.

*The value of K can be calculated approximately from the Exposure Index (S) of a film as follows:

$$I = \frac{CA^2}{TS} \text{ footcandles (American Standard Z38.2.6.1948)}$$

then $IT = \frac{CA^2}{S}$ footcandle seconds.

also $\frac{QM}{4\pi D^2} = \frac{A^2}{4\pi K} = IT$

from which $K = \frac{S}{4\pi C}$

T=exposure time in seconds.
A=relative aperture or f/-number.
C=constant between 15 and 30
I=illumination incident on the exposure meter expressed in footcandles.
S=film exposure index. (A.S.A. Z38.2.1-1947)

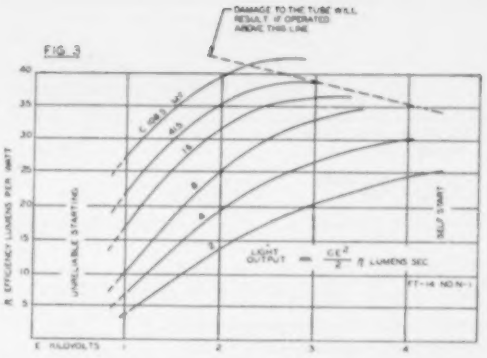

DAMAGE TO THE TUBE WILL RESULT IF OPERATED ABOVE THIS LINE
FIG. 3
EFFICIENCY LUMENS PER WATT
UNRELIABLE STARTING
SELF START
LIGHT OUTPUT = CE²/2 ft LUMENS SEC
FT-214 NO N-1
E KILOVOLTS

Figure 3. Light-producing efficiency of the spiral flashtube element as used in the General Electric Company FT-220, FT-210, FT-214 tube.

Table I

Film Type	*K*
Kodachome Prof. Film, Daylight Type	0.012
Ektachrome Prof. Film, Daylight Type	0.012
Kodachrome Daylight 35 mm. and Bantam	0.015
Ansco Tungsten Color Positive Conv. 12 filter	0.038

	Thin Negative	*Well Exposed*
Black and White Film A.S.A. Exposure Index 250	1.25	0.31
Black and White Film A.S.A. Exposure Index 200	1.0	0.25
Black and White Film A.S.A. Exposure Index 100	.49	0.12
Black and White Film A.S.A. Exposure Index 50	.25	0.06

Note that K here is used in the equation $DA = \sqrt{KQM}$. This K is numerically equal to K^2 as used in the J. O. S. A. July 1946, p. 398, article.

This equation has been a most useful one for designing flash equipment to meet the desires of photographers. Note that the only items of interest to the photographer are D and A on the left hand side of the equation. On the other side are the items of interest to the equipment designer, Q and M, with the K factor as a common number depending upon the type of film. Once a photographer decides on what value of distance, D, and aperture, A, he wants for a given film, then the equipment designer can select a flashtube of suitable efficiency, capacitors, operating voltage, and a reflector to accomplish the desired result.

Exposure Determination for Color Photography with the Light Meter

Here the problem is (1) the adjustment of lighting equipment and (2) the setting of the camera lens aperture so that the image of the subject has a satisfactory exposure, that is, a satisfactory amount of footcandle-seconds. In this way the film will record the image of the subject in color and with suitable density.

There are two distinct methods of using the light meter for setting satisfactory conditions for color photography. These are:

(1) Incident light determination at the *subject* and
(2) Incident light determination at the *film* position.

The second method is more difficult to accomplish experimentally but it does give a more comprehensive answer that includes factors such as aperture and bellows extension.

The first method involves the direct use of the light meter

Table II*

Film	Suggested Filter for Xenon Flash	At f/3.5 Average Required Incident Exposure Footcandle Seconds
Kodachrome Prof. Film, Daylight Type	81-B	100
Ektachrome Prof. Film, Daylight Type	CC05M	100
Kodachrome, Daylight, (35 mm. and Bantam)	81-B	80
Kodacolor (Roll only)	81-B	32
Ansco Tungsten† Color Positive	Conv. 12	32
Ansco Daylight Color Positive	CC44+CC25	90

*Preliminary, subject to revision.
†Ansco recommends the Tungsten type for xenon flash.

to measure the incident light from the source. It is necessary, next, to know what value of incident light is required for each different type of color sensitive material at a given lens aperture. A list of preliminary values of incident light for f/3.5 aperture are given in Table II. For example, Kodachrome Professional Film, Daylight Type, requires 100 footcandle-seconds. Therefore the meter should read 100 footcandle-seconds when aimed directly at the key light from the subject position. For other apertures, the incident light, theoretically, should vary as shown in Table III, since the light on the film varies as the square of the aperture. Slight departures from this table are to be expected in actual photography since the marked lens aperture values are not equivalent to the light-transmission effective aperture values.

The light meter has a scale on the Polaroid attenuator that gives the aperture when the *meter* needle reads the value given in Table II, such as 100 for professional Kodachrome Film. Trial flashes are measured until the incident light causes the meter to read 100 with the Polaroid attenuator set at the desired aperture. Either the lights are moved or the Polaroid attenuator changed to obtain the desired reading.

The contribution of each fill light is usually measured separately so that their values can be compared to the main key light. For flat lighting the fill may be half that of the key light while contrast lighting may require one tenth.

Table III

f/# Camera Aperture	Exposure at Subject Footcandle Seconds (Lumen-Seconds/sq.ft.)
1	7.85
1.5	18.5
2.0	32.6
2.5	50.8
3.5	100
4.5	165
5.6	256
6.3	326
8	520
11	986
16	2080
22	3940
32	8380

Lumen seconds per square foot required for Kodachrome Professional Film, Daylight Type with 81-B filter at indicated stops.

Figure 4. A phototube probe measuring the light at the ground glass during the flash. A black cloth is put over the back of the camera to exclude stray light from the flash.

Experience is required in order for a photographer to get the result he desires. His experiments should be accompanied by light meter records so that he can use the light meter later to achieve the equivalent result.

The second method, incident light determination at the film position, requires a phototube probe attachment (see Figure 4) which fastens to the ground glass with adhesive suction cups. This external phototube is connected in parallel with the phototube in the light meter. Therefore, the internal phototube must be made inactive by turning the Polaroid attenuator to the extinction value or covering the light input opening when the probe is used.

A standardized subject must be used so that the probe phototube can be located to receive light from the image. A white card of sufficient size so that its image will fill the phototube area is one satisfactory method. When once the meter reading is determined for conditions that result in a satisfactory color photograph for a particular type of color sensitive material, the system is calibrated. Conditions can be set to exactly the same values at some later time, with other lights or different apertures. The probe lightmeter reading will be the same for a given film material, since the reading is proportional to the amount of light energy that arrives at the film.

This probe method of the measurement of the light energy at the film position is the most fundamental way to evaluate exposure since factors such as aperture, lens extension, lens light absorption, lamp position, and lamp efficiency are included. Even lens flare can be measured by using a black velvet target. Likewise the meter can record the ground glass image of any subject. Professional color photographers find that the light meter is a most valuable tool, because it takes much of the guess work out of exposure determinations.

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A New Low-Voltage Low-Power Flashtube of High Efficiency†

E. B. NOEL, ASPA AND P. B. DAVIS*

Abstract: By designing specifically for full loading at 100 watt-seconds and at 1000 volts, it has been possible to produce a flashtube with 75% more light output than that of existing flashtubes when operated under these same conditions. Output is shown to increase, in general, when either voltage or pressure is increased. A xenon pressure of 30 cm gave good output and yet permitted easy triggering. The optimum length at this pressure when using tubing 4 mm in inside diameter was found to be 3 inches. This short length could be used in the form of a simple "U" and thus avoid losses due to coiling and self-absorption. However, a properly designed reflector is required with this shape. No conventional base is provided as the new tube is intended to be permanently installed in the flashtube equipment. Also no enclosing bulb is used, and it is suggested that a clear plastic cover be placed over the reflector. With daylight type color films very little filtering is required for satisfactory results. Portable and semi-portable flash units have been built weighing from 3 to 5½ lbs., and with these the light output of the new flashtube tube compares favorably with that of a No. 5 photoflash lamp when the latter is used at high shutter speed.

ELECTRIC discharge flashtubes were introduced to the practicing photographic profession a little more than ten years ago. Since then their use has steadily increased so that they now occupy an important place in the field of photographic illuminants[1]. Their low power drain, cool light, extraordinary motion stopping ability, and long life of many thousands of flashes made them unique among photographic light sources. The first units made available were designed for studio use, and were what now would be termed medium powered outfits. Since the war the progress in equipment design has permitted the production of small, light-weight battery-operated units that are readily portable. Such units are very popular and have greatly increased the use of flashtubes.

In an attempt to reduce the size and weight of portable flashtube equipments, some manufacturers have chosen to use electrolytic condensers connected in series parallel for storage of the electrical energy. Such units operate at slightly less than 1000 volts, compared to 2000 or more volts customary with paper-dielectric capacitors. Existing flashtubes will work over this voltage range, but in general they have been designed for best performance at the higher voltages, and for power inputs considerably greater than furnished by most portable outfits.

This paper deals with the design and characteristics of an entirely new low-voltage, low-power flashtube of high efficiency, constructed specifically for use with lightweight mobile power units. The new lamp, which is shown in Fig. 1, is designated as the FT-110. For comparison, Fig. 2 shows the well-known FT-210 high-voltage tube used in many existing flashtube equipments.

Flashtube Design Variables

Basically a flashtube is a comparatively simple device. It consists essentially of a tube filled with gas, usually xenon, and having electrodes at each end. By means of a suitable electrical circuit a condenser charged to high voltage is discharged through the tube causing it to produce a flash of light. There are many variables which affect the light output of a flashtube, and it is the problem of the designer to juggle them to give the best possible all-around performance. The most important variables to be considered are: 1. Total energy stored in the condenser (watt-seconds or joules). 2. Voltage at which the energy is stored. 3. Inside diameter of the flash tube. 4. Length of the discharge path (arc gap length). 5. Pressure of filling gas. 6. Kind of filling gas. 7. Tube shape.

The first two variables mentioned are properties of the circuit with which the tube is to be used; the last five variables are features of the lamp itself. Because of this it is impossible to separate the design of the tube from that of the circuit. The lamp designer, therefore, is limited somewhat by practical considerations of the electrical circuit such as the voltage limits of available condensers, and safe working potentials for sockets, cables, and connectors. The effect of each of the above mentioned seven variables will be discussed in the course of the paper, but in a somewhat different order than that in which they were listed.

A photographer can state his needs precisely by specifying that a flashtube outfit have a "Guide Number" of so-and-so when used with such-and-such a film developed in a certain manner. The equipment designer can meet these specifications in a variety of ways. In the past most equipment operated in the range of 2000 to 4000 volts. At these high voltages flashtubes have good efficiency, and the paper-dielectric capacitors can be utilized to the full advantage. It is also possible to make a flashtube unit which will meet the same Guide Number requirement by using electrolytic condensers and a much lower voltage. Previous designs of flashtubes, however, operate

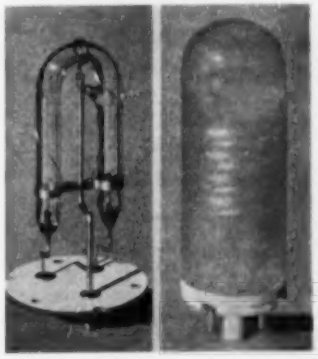


Fig. 1. (Left) The new FT-110 Flashtube rated at 100 watt-seconds and 1000 volts. It is designed for permanent installation and to be used with a specially designed reflector covered with a sheet of clear plastic. Fig. 2. (Right) The older and well-known FT-210 high-voltage flashtube. It is rated at 200 watt-seconds and 2000 volts, and is representative of a number of similarly rated flashtubes that are used in portable service.

†Delivered at PSA Convention, St. Louis, Mo., 20 October 1949.

*Lamp Development Laboratory, General Electric Co., Nela Park, E. Cleveland 12, Ohio. Development Engineer and Assistant, respectively.

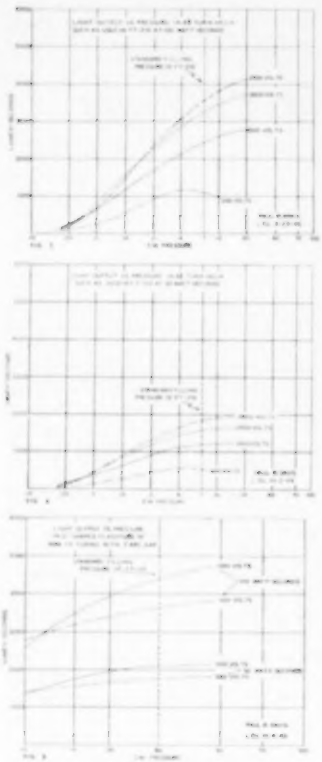


Fig. 3. (Top) Light output vs. xenon gas pressure in a FT-210 helix at various voltages and at a loading of 100 watt-seconds. Fig. 4. (Center) Light output vs. xenon gas pressure in a FT-210 helix at various voltages and at a loading of 50 watt-seconds. Fig. 5. (Bottom) Light output vs. xenon gas pressure in a U-tube of the dimensions of the FT-110, for 500 and 1000 volts, and for 50 and 100 watt-seconds.

at appreciable loss of efficiency under these conditions.

The energy storage, E, of a capacitor varies as the square of the voltage according to equation (1),

$$E = \tfrac{1}{2} CV^2$$

E=energy in watt-seconds (joules)
C=capacity in microfarads
V=voltage in kilovolts

Therefore, for the same energy, four times as much capacity will be needed at 1000 volts as at 2000. This is no problem with electrolytics, because they are low voltage devices characterized by high capacity for a given volume. Within the last few years improvements in electrolytic capacitors have been made so that several companies are offering 450 to 500 volt capacitors which are considered satisfactory for flashtube use. Flashtube units have appeared on the market using such capacitors in a voltage doubler circuit. These units operate the existing high-voltage flashtubes at about 1000 volts which is the lower limit of the tube voltage range. The new General Electric FT-110 is the first flashtube specifically designed for operation in the 800 to 1050 volt range. By a proper choice of design constants it has been possible to make the new tube much more efficient when operated at low voltage and low loading than the older tubes under these same conditions. The increase in efficiency has been so great that the output of the FT-110 at 100 watt-seconds and 1000 volts even exceeds that of the older tubes when the latter are operated at the same energy loading at the much higher voltages for which they were normally intended.

Energy and Voltage Choices

A survey showed that almost all portable flashtube units on the market operated at less than 100 watt-seconds per lamp, while the existing FT-210, FT-214, and FT-220 flashtubes used on such outfits were all rated and designed for 200 watt-seconds at 2000 volts. From experience with these outfits it was felt that 100 watt-seconds would produce adequate light output for professional portable use, and 50 watt-seconds would be ample for advanced amateur use. If the new tubes could be designed specifically for these energies, more efficiency would result than if a larger tube, such as the FT-210, were run considerably under rating.

The primary objective was to develop a good tube for the nominal 1000 volt range for outfits using electrolytic capacitors on voltage doubler circuits, but since a power pack could also be designed to operate at half this voltage by using the electrolytic capacitors in multiple, the study of tube characteristics was extended downward to the 500 volt region.

Effects of Varying the Gas Pressure

The effects of varying gas pressure in both the older and newer flashtubes are shown in Figs. 3, 4, and 5. The data on the FT-210 helix (Figs. 3 and 4) are included for purposes of later comparison, and also because this helix is large enough so that when run at less than half its maximum rated loading, readings can be taken over a wide range of voltage and pressure without destruction of the tube, and thus better illustrate the effect of the variations. Figure 5 shows the effect of pressure changes in a small U-tube of the dimensions of the new FT-110 which is the subject of this paper.

Referring now to Figs. 3 and 4, it should be pointed out that the helix of the FT-210 is identical with helics used in the FT-214, FT-215, and FT-220, all of which are used in portable flashtube service. With this size of helix, doubling the pressure results in considerable increase in light if the pressures are in the lower part of the range shown in Figs. 3 and 4. At higher pressures the increased output is very slight even for large changes in pressure.

At very high pressures the light output will decrease with increase in gas pressure, as may be seen in the 500 volt curves of Figs. 3 and 4. The higher the operating voltage, the higher the pressure at which maximum light output is reached. (In the case of these data the higher voltage curves have not been carried past the maximum because of operating difficulties.) However, flashtubes are not always designed to operate at the pressure corresponding to maximum light output because of other considerations such as flashover, difficulty of triggering, and the very real cost of xenon when used at high pressures. Thus 7 cm has been chosen as a practical value of pressure for use in the FT-210 and other flashtubes using the same helix.

Table 1

Light Output in Lumen-Seconds at Various Voltages and at 100 W.S. Loading

Voltage	500V	1000V	2000V	2800V
FT-210 helix				
0.25 cm pressure	120	240	200	200
0.5 cm pressure	250	650	800	700
2 cm pressure	900	1700	2275	2400
7.0 cm pressure	1100	2450	3300	3600
5" U-tube 4 mm I.D.				
10 cm pressure	2800	2600	——	——
15 cm pressure	3200	3500	——	——
30 cm pressure	3700	4350	——	——
45 cm pressure	3800	4700	——	——

Effects of Varying the Voltage

From Figs. 3, 4, and 5 it is possible to observe the effect of varying voltage, other variables remaining constant. Table I, taken from these curves, gives the light output at various voltages for the two types of tubes at each of four pressures.

At the higher pressures the efficiency increases markedly as the voltage increases. Since flashtubes are usually filled to relatively high pressures the flashtube designer, therefore, prefers to operate at high voltages in order to obtain high efficiency and high output. However, he is not free to pick his value as high as he often would like, as there are a number of limitations. Some of these are the increased cost and bulk of the higher voltage cables and connectors, and the difficulty of maintaining adequate electrical clearance and insulation in sockets, tube bases, and within the tube structure itself. And not the least among the limitations is the fact the higher the voltage, the greater the danger of tube damage by crazing, a matter which will be discussed a little later.

It should be noted that at the lower filling pressures an increase in voltage may result in a decrease in light output and efficiency. This somewhat unexpected phenomenon has been observed in several types of flashtubes. However, it occurs in a pressure region that is seldom of interest to a flashtube designer.

Effect of Varying the Energy

Figure 6 shows the changes in output of two U-tubes and the older FT-210 as the energy (Equation 1) is increased. For all three tubes, if the voltage is held constant, the light output is almost directly proportional to the energy. This means that the efficiency is not affected to any great degree by changes in energy at a constant value of voltage. Thus when several lamps are operated in parallel off a single bank of capacitors, the total light from all the lamps will be the same as if all the capacitor energy had been delivered to a single lamp.

Diameter, Length, and Shape

The diameter of the tubing of the flashtube affects performance, and is tied in with tube length, pressure, voltage, and loading in a complicated manner. Since these variables can be adjusted somewhat to accommodate variations in diameter, the choice of tubing size is often strongly influenced by commercial and manufacturing considerations. In the case of the new FT-110 U-tube, cost and ease of manufacture dictated the 6mm O.D., 4 mm I.D. tubing which is a commercial size, and other variables were adjusted to obtain the best efficiency.

Table 2

Effect of Coiling a Flashtube

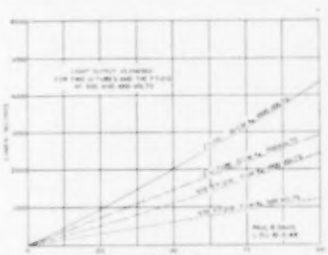
Configuration	*Relative light output*
Straight tube	100%
One turn	95%
Two turns	83%

It perhaps should be pointed out now that the 4½ turn FT-210 helix and the U-tubes which we have been considering are all constructed of Pyrex tubing 6 mm in outside diameter and 4 mm inside diameter. Obviously the arc gap lengths are different (3" for the U-tubes, and 12½" for the helix) and the shapes are different, and both changes markedly affect the performance. Figure 7 shows the effect of changing the arc gap length of a U-tube from 2 inches to 15 inches, keeping pressure, voltage, and energy constant. In this case the output and efficiency are a maximum at a length of three inches. Three inches, in this case, also happens to be a practical operating point, as determined by life tests. It sometimes happens that a tube of optimum length to give maximum output will not stand up when operated in a normal manner. In that case the designer must either use a longer length, or, if possible, shift to a more resistant material for the tube, such as quartz.

A small compact coil as a light source is the most desirable shape from the point of view of light redirection by means of a reflector. A large, or a long slender source of light means poor light control and poor reflector utilization. (Sometimes spoken of as "reflector efficiency".) However, a long straight flashtube produces more light than the same length of tubing wound into a helix because the ionized gas of the flashtube is somewhat opaque to its own radiation. Table 2 shows the effect of coiling a straight tube into a helix. All three tubes were made of the same tubing and had the same arc gap length, and gas pressure. Even with only two turns the light output is 17% less than for an equal length of straight tubing. If the experiment had been carried further, say to 4½ turns, the light output would be a still smaller percentage of that of the straight tube. On the other hand the reflector designer cannot utilize efficiently a long slender source. Thus the shape of commercial flashtubes frequently depends upon what is practical in the combination of lamp and reflector shapes. In the case of the new FT-110 it has been found that optically a simple short "U" is not too difficult to handle with a good reflector design, and inherently is more efficient than a coil.

The arc-gap length of the U-tube was taken to be three inches. Figure 7 shows this to be the optimum length for maximum output. However, a tube on the short side of this would have a higher brightness per unit area, and the smaller source would produce a higher reflector efficiency. Considering the combination of lamp and reflector, a length less than three inches might be the most desirable, but in this case two inch tubes became damaged quickly, and 2½" tubes were on the borderline. Life tests showed that tubes with a three inch gap would perform satisfactorily, so there was no question as to the selection of the three inch length.

A U-tube of high efficiency and with a 3" arc gap is only half the story. The light from it must be redirected uniformly and efficiently onto the picture area. If the FT-110 is used with the various types of existing reflectors, in most cases the results will



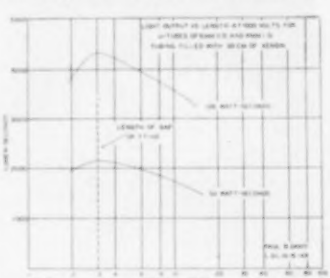


Fig. 6. (Left) Light output vs. energy for two U-tubes and the FT-210 at 500 and 1000 volts. Fig. 7. (Right) Light output vs. length at 1000 volts for U-tubes of 6 mm O.D. and 4 mm I.D. tubing filled with 30 cm of xenon.

be unsatisfactory due either to hot spots in the beam, or to wasted spilled light. This would not be the case if the new tube had a one or two turn coil, but then the tube itself would be less efficient. For the new U-tube a reflector has been designed by Mr. L. R. Benjamin of the Engineering Division at Nela Park, combining the right shape with just the right amount of diffusion so that little light is wasted and there are no hot spots in the beam. In spite of the difficulties introduced by a U-shaped source, the beam is actually more uniform than that of most existing flash outfits.

Choice of Pressure for the FT-110

As Table 1 shows, a high voltage is desirable if good output and efficiency are to be obtained, yet the restrictions to 1000 volts and 100 watt-seconds loading were not without benefit in the case of the FT-110, because it was found that a short U-tube would handle the maximum energy without damage to the tube walls. With the existing 2000 volts glass tubes designed for 200 watt-seconds, such as the FT-210, so much tubing is necessary to dissipate the energy that the only useful form is a 4½ turn helix with considerable losses due to self absorption. The higher the voltage of operation for a given amount of energy, the faster the discharge, and the greater the peak temperature to which the tube walls are subjected[2]. (Knott[3] mentions a discharge temperature of 7000°C. This probably is in the center of the arc.)

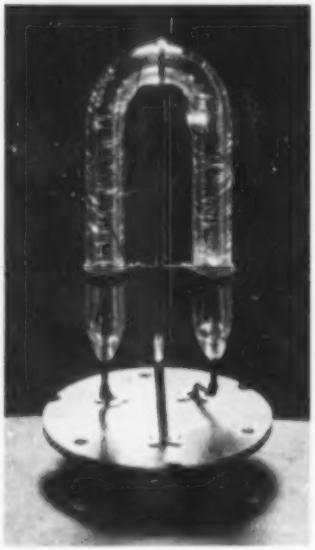


Fig. 8. An example of "crazing" in a flashtube. The inner surface of the tubing is covered with a maze of fine cracks produced by heat shock and excessive peak temperature during the discharge.

Excessive peak temperature may release contaminating gases which may make the tube inoperative or hard to flash. It also can damage the inner surfaces of the tube walls. An example of such damage is shown in Fig. 8 where the whole inside surface is covered with tiny cracks or "craze" marks as a result of the heat shocks from a few dozen flashes. Frequently, one of these many cracks will extend clear through the tube walls allowing the flashtube to leak and thus become inoperative. The lamp of Fig. 8 was operated at too high a voltage (1500 volts), and at too low a pressure (15 cm), so that the 100 watt-seconds of energy was dissipated too quickly. This difficulty does not occur at 1000 volts or less with the same size of tube filled to 30 cm because the discharge is slower and consequently the peak temperature is lower.

Even under these satisfactory conditions of operation the peak power which must be handled by the tube is extremely high. According to H. W. Lord and H. S. Lasher of the General Electric Research Laboratory, Schenectady, N. Y., for the satisfactory operating conditions just stated, the maximum instantaneous power is 580 kilowatts. Their data is plotted in Fig. 9 which shows that 140 microseconds after the start the power has decreased to one-third of the peak value.

A filling pressure of 30 cm was selected for 1000 volt operation as it produced nearly the maximum output (see Fig. 5) and still was easy to flash. The minimum potential at which a tube will flash depends, among other things, upon the peak voltage, rate of rise, and the energy in a high-voltage pulse applied to the trigger electrode. It is not safe to use an excessively high trigger pulse in order to insure easy flashing, since trigger voltages are measured in kilovolts, and too strong a trigger pulse will cause flashover, puncture, or failure. For good performance an allowance has to be made with portable outfits for a decline in battery voltage toward the end of charge, so a satisfactory flashtube for portable use must be easy to trigger. At 500 volts, tubes filled to 45 cm still could be flashed under laboratory conditions, but at this voltage it is doubtful if a filling pressure greater

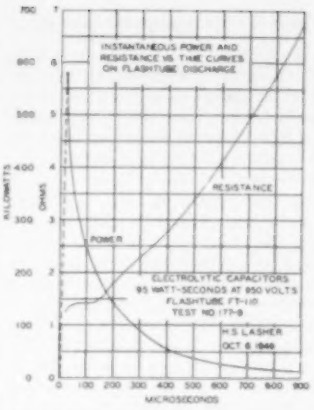


Fig. 9. Power and tube resistance vs. time in microseconds during a 95 watt-second discharge through a FT-110 Flashtube.

than 10 cm would be safe for a commercial tube because of the reasons just mentioned.

The characteristics of pulse transformers for triggering flashtubes have been studied recently by H. W. Lord of the General Electric Research Laboratory, Schenectady, and E. C. Hill of the Specialty Transformer Division at Fort Wayne. They have produced a remarkably efficient design requiring so little primary voltage and power that the usual thyratron or strobotron used in the tripping circuit can be dispensed with, and instead a simple switch can be connected into the primary circuit of the trigger transformer. This of course reduces the cost of the power pack. Many camera shutters now have such properly timed switch contacts built into them. With one of the new trigger coils connected to the contacts of such a medium-priced amateur shutter, a lightly loaded FT-110 was flashed 57,600 times before shutter contact trouble developed. It is felt that the load on the shutter contacts with this arrangement is no greater, and possibly is less than with ordinary flash bulbs.

Flashtubes made by the General Electric Company all require a trigger transformer because a high pressure of filling gas has been chosen in order to obtain high output. It is possible to make flashtubes requiring no triggering transformer, and which flash directly upon closing a high-voltage switch or relay which connects the flashtube directly to the fully charged bank of capacitors. For these flashtubes, low pressure must be used, and the sacrifice in output is great. For example, Fig. 3 gives the output of the

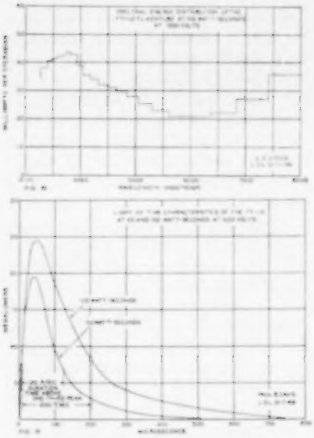


Fig. 10. (Top) The spectral energy distribution of the FT-110 Flashtube at 1000 volts and an energy of 100 watt-seconds. Fig. 11. (Bottom) Light output vs. time for the FT-110 Flashtube at 50 and 100 watt-seconds at 1000 volts.

standard FT-210 at 2800 volts to be 3600 lumen-seconds. This tube is filled with xenon to a pressure of 7 cm. In order to get it to flash when connected directly without a trigger coil the pressure of xenon must be reduced to about one-half a centimeter, at which pressure Fig. 3 shows the light output as 700 lumen-seconds, or only one-fifth as much. Therefore the flash outfit will be only one-fifth as effective, or a heavier and more expensive power pack must be used to make up the difference in efficiency.

No Conventional Bulb and Base

A well-made flashtube has a life of many thousands of flashes so that in normal use it lasts as long or longer than many of the components of the power pack. For all practical purposes it can be soldered in place as is customary with resistors or capacitors. If this is done the usual radiotube type of socket is not needed, and considerable modification in the flashtube base and envelope is possible. The new FT-110 U-tube lamp (Fig. 1) is intended for such a permanent installation and is furnished mounted on a phenolic disk with solder pins on the back. The disk has three holes so that it can be fastened to a sub-panel with bolts or eyelets. Being circular, it can also be spun into the neck of a reflector as the diameter is such that sufficient electrical clearance has been provided. Also there are three notches around the edge so that when rolled in, the disk is not liable to rotate. Since no glass envelope is provided it is essential that a clear sheet of plastic be spun in the reflector opening. This has the advantage of being unbreakable, which is not true of a glass bulb, and at the same time keeps the reflector surface clean and protects the operator from possible shock. The whole arrangement makes for minimum cost.

Characteristics of the FT-110

The new U-shaped FT-110 is a remarkably efficient tube. At 1000 volts and 100 watt-seconds it produces 4350 lumen-seconds. This is 25% more than the FT-210 produces when operated at 100 watt-seconds and its maximum rated potential of 2500 volts. It is 75% more than of the FT-210 when operated at the same energy but at the 1000 volts customary with powerpacks equipped with electrolytic capacitors. This high efficiency makes for lighter and cheaper power packs, or for more powerful units at the same weight.

Xenon filling gas is used because it is the most efficient of all gases. Fortunately, also, it produces a quality of light close to that suitable for daylight type color films[4,5]. Color pictures taken with no filter would be acceptable to an uncritical observer. The use of a CC-10Y filter, (a very light minus blue), gives excellent rendition, and requires at most a quarter of a stop increased exposure. The spectral energy distribution of the FT-110 at 100 watt-seconds is given in Fig. 10. In the visible portion of the spectrum it will be seen that the light is rich at the blue end of the spectrum, and also there is appreciable long-wave ultraviolet, and short-wave infrared radiation.

The effective flash duration of a discharge is not as definite a quantity as the open time of a mechanical shutter. The action stopping power of high-speed flash depends upon the density of exposure because of the approximately exponential decay of the light. For ordinary purposes the time duration of the flash is often taken as the time during which the light output is above one-third peak value. Light-time curves for the FT-110 at 50 and 100 watt-seconds are given in Fig. 11 from which the time above one-third peak can be seen to be 200 micro-seconds (1/5000 sec.) for the 100 watt-second flash. This is sufficiently rapid for all ordinary photography and fast enough to eliminate any unsharpness due to camera or subject motion. At 50 watt-seconds the duration is approximately 1/8000 second.

Murphy and Edgerton[2] showed that during the first few microseconds of discharge the volt-ampere curve of a flashtube has a negative slope, as is typical of arc discharges, but then quickly changes to a marked positive slope as soon as the point of peak current is reached. All through the relatively long decay period the slope remains positive, which means a positive value of resistance. Because of this it is possible to connect two or more flashtubes in parallel without dividing impedance and have them share equally the stored energy of the capacitor. Of course, no more total light

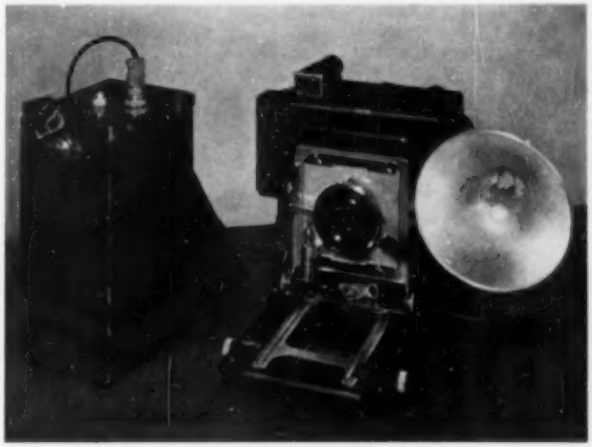


Fig. 12. Laboratory model of a 75 watt-second battery operated portable flashtube outfit mounted on a 4x5 Speed Graphic.

is produced; a given quantity then is distributed equally between the several sources.

With the tubes which Murphy and Edgerton measured it was possible to draw a single straight line which agreed reasonably well with their observed data through the origin of the graph and through the positive portion of the volt-ampere curve. The slope of the straight line could be taken, for all practical purposes, as the resistance of the tube. When this procedure was tried with a plot of data taken on the FT-110, the approximating straight line did not pass anywhere near the origin. Therefore, while the effective resistance of the flashtube is positive, the value changes constantly throughout the discharge. This is probably due to the fact that the "cut-off voltage" at the end of the discharge is a larger fraction of the initial voltage than in the cases studied by Murphy and Edgerton. Figure 9 shows the resistance of the FT-110 as a function of time for a 95 watt-second discharge. The negative resistance values at the beginning of the discharge have been omitted. Starting at about 20 microseconds the resistance has a positive value of 1¼ ohms which increases to nearly 7 ohms at 900 microseconds. For a 48 watt-second discharge the resistance vs. time curve was found to be almost identical to the one given.

Units Using the FT-110

A number of portable laboratory power units have been built using the FT-110 and the special reflector in order to gain practical experience. Figure 12 shows a 75 watt-second power pack weighing 5½ lbs. built by Mr. Harold Lord of the General Electric Research Laboratory, Schenectady. Two lamp house units, each weighing about a pound, have been built for this power pack, one arranged for thyratron triggering, and the other for direct triggering. The direct triggering lamp house unit is shown in Fig. 12. Using Super-XX roll film, a satisfactory Guide Number is 105 with normal development in Microdol, and 180 using 150% development in DK-60a. Color experience is not extensive, but with Kodachrome daylight film and a CC-10Y the Guide Number is approximately 33.

A unit of this type possesses sufficient power for most professional portable requirements, and is equal to the better present day portables of considerably more weight. Experience with this unit has shown that it is well suited to professional use, but has some disadvantages for the amateur. Because of infrequent use, the amateur is apt to find the batteries have run down when he wants to use it. Also, after a long idle period the electrolytic condensers will draw a heavy current for a considerable period when first charged, and this in itself may run the battery down. Some very light semi-portable alternating current units are perhaps more suitable for the amateur field than the fully portable battery-operated power packs.

Two 40 watt-second semi-portable power supplies have been built to operate from alternating current. One of them is shown in Fig. 13. Transformer, rectifier, condensers, trigger coil, and a complete thyratron tripping circuit have all been placed inside a 2"x5"x7" radio chasis, and with lamp and reflector weigh 3 lbs., exclusive of the twenty foot cord. This is less weight than many ordinary photoflash dry cell cases, and so like them, these small flash units may be fastened to the side of the camera. With the arrangement shown the lamp is wired directly into the circuit, and the reflector is attached to one side of the metal housing. This eliminates all external high voltage cords and connectors.

The experience of the authors with these 40 watt-second units in amateur service has been very satisfactory. With Super-XX roll film, well exposed negatives have been obtained with a Guide Number of 75 using normal development in Microdol, or with a Guide Number of 130 using 150% development in DK-60a. This latter Guide Number is approximately that of a Number 5 photoflash lamp when used at a shutter speed of 1/400 second. With daylight Kodachrome and a CC-10Y filter the Guide Number is 23. These particular units have been built with a thyratron tripping circuit so that one unit can be "slaved" with a photocell. Some cost could be saved if the units were made direct triggering.

Fig. 13. Laboratory model of a 40 watt-second semi-portable alternating current flashtube outfit mounted on a reflex camera. Shown in the foreground is a photocell for use when the unit is to be "slaved", as well as an auxiliary plug-in reflector and filament lamp which can be used to furnish modeling illumination.

There are a number of advantages of the small a-c units. Plugging into the line eliminates the weight and space of the battery and vibrator. The unit is always ready, and recharges faster than do small vibrator outfits. The a-c unit shown can be reflashed in three seconds and is practically fully recharged in nine seconds. Alternating current units can be made smaller, lighter and cheaper than battery units, and are not too heavy to be attached directly to cameras as small as a Leica. Further, since ample power is available, an auxiliary modeling lamp can be used. The power unit illustrated in Fig. 13 has a convenience outlet on the top into which can be plugged the auxiliary filament lamp and reflector unit shown in the left foreground. (Also shown in the right foreground is the photocell which can be plugged in a separate socket when needed.) For the modeling lamp the Photoenlarger lamps Nos. 111 and 113 have been used. Because of the small distance between the centers of the main reflector and the auxiliary reflector no trouble has been experienced with parallax.

The new U-shaped FT-110 is an important contribution to the field of flashtube photography. Its unique shape permits high efficiency with low absorption losses, and by designing specifically for the low voltage and power used in portable equipment, it has been possible to increase the tube efficiency still further. This means either lighter, lower cost units, or more powerful units at the same weight when compared to present equipment.

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*Contrast Grading Problems of Photographic Papers**

By JOHN M. CENTA

HAVE YOU EVER printed a negative on a No. 2 (normal) grade paper and then printed the same negative on another manufacturer's grade No. 2 paper? Did you expect that the papers would be effectively the same and that the resultant prints would be similar—only to find to your surprise that there was a contrast difference between prints of at least one grade of paper?

If you have had this experience, then this article is dedicated to furthering your understanding of this strange occurrence, with some suggestions as to possible methods of resolving this undesirable situation.

Repeated attempts have been made to alleviate this situation by providing a common paper grading system through American Standards Association channels, but this work has apparently been stalled by the seeming impossibility of accurately designating papers with one unique grade value. I will suggest an alternate plan of approach whereby the consumer will be supplied the information necessary to do the best possible printing job without abandoning the long range search for a universal grading system.

This subject is highly controversial. Paper grade or contrast determination is a science, but it cannot be divorced completely from the artistic viewpoint. In addition, the whole photographic paper industry has based its progress on restricted company techniques for producing desired effects. Any attempt to standardize these more or less intangible paper qualities brings an immediate clash among producers and among consumers as to which quality characteristics are most significant.

It is only reasonable therefore that I establish my relationship to this problem very clearly. As Dr. Jekyll, I am Quality Control Supervisor for the Rochester Plant of the du Pont Company, where my prime responsibility is to maintain product quality including all functions of paper grading. In line with this company affiliation, I have been actively working as one of the company-representatives on the American Standards Association Committee (Z-38, Subcommittee 2) which is trying to solve this paper grading riddle on an industry-wide basis.

As Mr. Hyde, I am Chairman of the PSA Standards Committee, commissioned to work with the duly appointed PSA representatives in promoting all types of PSA and American Standards that are beneficial to consumer PSA. With this responsibility to the consumer, I can personally say that the need for a universally adopted paper contrast grading system is very real and would be of untold benefit to all consumers.

In a sense the photographic paper industry is now at the same stage of progress and is equally as ready for standardization as was the film industry when we had Weston, General Electric, Kodak, D.I.N. and Scheiner speeds.

Paper manufacturers are aware of the undesirability of long continuing the existent hodge-podge classification systems and will even admit, rather wryly under prodding, that a grade 2 contact paper is not necessarily the same effective grade of contrast as their enlarging papers labelled grade 2. Yet as things now stand the individual manufacturer is not in a position to adjust his lines into the proper relationship because of the disturbing effects such change by only one concern would have on the long established habits of his consuming public.

The stimulus, the developmental work, and the sponsorship of such an industry-wide standardization program must come from a disinterested source, and the American Standards Association is the logical sponsor. The ASA Committee Z-38 thoroughly appreciates its responsibilities in this matter and has set up a special Subgroup of Subcommittee 2, whose sole responsibility for the past two or three years has been the solution of this paper grading problem. Representatives from manufacturers and the National Bureau of Standards have been meeting several times a year to discuss new data and to work out a grading system satisfactory to all parties, but progress has been slow.

The most serious stumbling block has been their accepted objective that a grade designation useful to the consumer must be comprised of *one* limiting value only. To date, no one has been able to propose any mutually acceptable system of deriving such a *single* value that will adequately describe a photographic paper.

Over a year ago the National Bureau of Standards and the Armed Forces felt that they could not afford to wait longer for the evolution of an American Standard grading system. They decided to work out their own contrast or grading specification techniques for use within Government agencies. As a large purchaser of photographic papers from all manufacturers for intermixed usage, Government agencies have been especially plagued by the lack of correlation between assigned grades of papers, so the urgency of their situation is understandable. Their approach to the grading problem, however, is so entirely dissimilar to any system previously proposed or considered—and, in my personal opinion, is so completely unacceptable to the average consumer in some respects—that the total issue has been even further confused and must again be referred to the ASA committee for both a short and a long-range solution.

Let's survey the present status of paper grading as practiced and utilized by various interested parties.

Historically, manufacturers have assigned arbitrary grade numbers to their products to satisfy customer's demands, as interpreted in their research and control laboratories. These systems like "Topsy" have just "growed", and inconsistencies have been introduced unavoidably as newly developed materials have been superimposed on long established products. Even so, serious difficulty is rarely encountered within any one manufacturers' line, for in most cases the materials graded all belong to a similar family of products.

If, however, a user were to purchase all grade No. 2 contact and projection papers now available on the open market and were to print them from one suitable "normal"

*Delivered at PSA Convention, St. Louis, Mo., 22 October 1949. Paper received 8 December 1949.

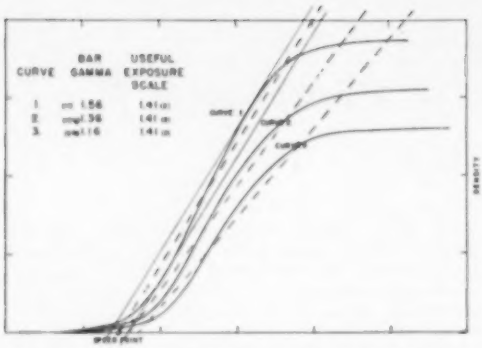


Figure One. Characteristic curves of a single photographic paper emulsion coated on identical raw stock after the addition of three different quantities of inert matting agent.

(so called) negative, he would find a spread in contrast equivalent in range to at least the spread of grades No. 1, 2 and 3 in any one manufacturer's line.

This contrast spread is a nuisance to the average photographer but to the Government and other purchasing agencies, who do not consistently buy one brand, it represents a terrible headache. We can conclude that the present grading practice is not adequate and should be revised or standardized as quickly as possible.

What Steps Have Been Taken to Rectify This Situation?

The ASA has already published a standard, Z38.2.3-1947, which defines the sensitometric conditions under which the more commonly used papers should be tested. This specifies color temperature of exposing source, exposure time, developer and development conditions, and even a method of plotting and recording the derived density data. However, this standard does not attempt in any degree to define a method of establishing contrast or grade numbers. It simply states the conditions for obtaining data which must then somehow be evaluated.

The first approach to a solution was offered the ASA committee when the Eastman Kodak representatives suggested that the work of Jones & Nelson be used as an adequate criterion for paper grading. In its essence this would mean the determination of the log exposure scale of the paper through fractional gradient techniques, and the American Standard "contrast" grades could then be arbitrarily established on an industry wide basis by assigning permissible Log ES ranges for each grade. This proposal to use paper Log ES (however derived) in contrast spacing has some merit and would work satisfactorily for a related family of curves; however, it can fail to grade papers on a rational basis if the sensitometric curve shapes vary. This failure can be readily demonstrated with papers now commercially manufactured and widely used which have different curve shapes but the same Log ES value. Under this proposal these papers would have the same American Standard grade number, yet the prints produced would be totally different.

The inadequacies of this Log ES proposal for grading papers were generally conceded, and it was next proposed to modify Jones and Nelson's fractional gradient method of determining Log ES and grade numbers through the use of Morrison's "Arcuance" system of limiting the bowing (or spread) of the toe of the sensitometric curve. This composite system could thus grade papers on the basis of their Log ES but must of necessity place either an arbitrary restriction on the permissible degree of bowing, or report the amount of bowing as a supplementary value after the grade number.

The proposal to arbitrarily restrict the degree of bowing is untenable because the shape of the toe is a dominant factor in the reproduction qualities of a paper—and some papers having excessive "bowing" or "arcuance" by usual trade standards are extremely valuable in specialized types of usage. As an example, the trend in single grade roll-printing papers such as Eastman Kodak "Unicontrast", DuPont "Unigam", or Ansco "Monodex" is in all cases to wide-arcuance papers because of their ability to print a wide variety of negative types acceptably. Certainly an American Standard cannot rule out the manufacture of any type of paper regardless of how unusual it may be. A suitable standard in my opinion should only report the unusual nature of the unusual product. On the other hand if we were to grade a product in this Jones, Nelson, Morrison system, we would have *two* independent and unique values reported—Log ES and arcuance. We must here remember that our American Standard objective was accepted as a contrast grading system based on *one* limiting or descriptive value.

In addition to these difficulties, the Jones, Nelson and Morrison systems are not fully acceptable to all manufacturers because they ignore all the shoulder area of the sensitometric curve beyond the tangency or speed point as derived in their system. Du Pont and Ansco have both insisted that higher shoulder densities are important and are used in everyday printing, especially with the curve shapes commonly found on the softer grades of projection papers having rounded shoulder characteristics. The ASA Subgroup is currently studying this phase of the problem in an attempt to define the actual shoulder area used—and there seems little doubt that a satisfactory compromise can be worked out.

At an early phase of the ASA Subgroup discussions, Du Pont suggested the use of an empirical formula which attempted to mathematically integrate toe scale, straight line scale, shoulder scale and D-Max to produce an "effective grade number". The method was suitable as a control tool when working with related families of curves, but failed when dissimilar curve types were evaluated. This approach was dropped.

Another contrast grading system proposed by the combined JAN-Federal Subcommittee on Photographic Papers and called the "Proposed Federal Specifications for Sensitized Photographic Papers and Cloths" was not worked out in conjunction with the ASA committee or with the manufacturers. It should be considered here as a possible solution to this problem since the technique involved is new and unique.

In this system, called the Bar-Gamma system, straight parallel framing lines, spaced a prescribed distance apart, are superimposed over a plotted sensitometric curve such that the left hand framing line is tangent to the shoulder and the right hand framing line is tangent to the seat of the toe. Scale balance values for specification purposes are thus partially defined by the tangency and intersection points of the framing lines of the curve. However, this proposed Federal system makes the fundamental error of basing the reported "contrast" or "grade" number solely on the angle that the framing lines make with the base line of the plotting paper. In other words, the more nearly

vertical the framing lines the harder the paper, the flatter the framing lines, the softer the paper.

The fallacy of this assumption (at least in my opinion) can be shown with a simple illustration. If three quantities of matting agent were added to the same basic emulsion and all were coated on the same paper stock, their curves would look like Figure One. Their derived Log ES values would be identical for all practical purposes. These three papers would differ only in the surface sheen and related D-Max and would correctly print the same negative. In other words, they are all the same grade number of paper by present manufacturing standards and average consumer usage, yet the Bar-Gamma system would class them as three different grades of paper insofar as grade number is concerned. (Grades 9½, 10½ and 11). Any grading system that yields results in such complete variance with average trade usage should be ruled out. Many new and potentially valuable innovations have been written into this proposed Federal Specification, but this work has not successfully solved the problem of contrast grading for the average consumer.

While reading bedtime stories to my youngsters one night I came across an old familiar fable that very neatly describes our ASA committee experiences to date. The story concerned the three blind men who visited a zoo, touched an elephant, and then described the beast. One blind man caught hold of the elephant's tail and said that surely the beast must be shaped like a rope; another felt the elephant's leg and described the beast as tall and sturdy like a tree; and the last man felt the elephant's trunk and described the elephant as a huge sinuous snake. Each description was correct within its own limitations but no one of the three was successful in describing the beast in its entirety because of inadequate information.

Certainly our approaches to American Standard paper grading have been as faltering and fallacious and for the same reason. In each discarded approach we have tried to select *one* paper characteristic and to base the whole grading system thereon—there is small wonder that the end results of such incomplete evaluations have been both misleading and often in error.

I believe that our present ASA Subgroup objective of grading papers with *one* significant value cannot be attained with our present knowledge. I would like to suggest that we would be far better off to completely reverse our field of thought and endeavor, and abandon for the time being the idea of grading papers according to the use of an American Standard. Instead, let's work out a uniform American Standard method of determining and reporting *all* the pertinent data on the many independent variables that go together in making up paper quality. Let's allow the manufacturer to call his papers anything he wants, but specify that he will furnish complete supplemental data (perhaps even on the label) describing his quality characteristics in American Standard terms.

This approach would answer the needs of the average consumer who buys his paper on the basis of manufacturer recommendations; of the Government or industrial purchasing agencies who buy their papers through fixed specifications; and of the photographic specialist who needs complete paper data in order to correctly apply photometric printing controls.

What Data Would Be Required to Define Paper Quality?

This question alone could provoke an extended discussion, but if I were asked to accurately describe paper quality I would suggest that the following five characteristics must be measured in some manner, for a variation in any one of these independent variables can very significantly affect print quality:

1. Useful D. Max (Usable blacks).
2. Useful total scale (Paper exposure scale relating to negative density range).
3. Toe scale (Highlight rendition).
4. Shoulder scale (Shadow rendition).
5. Speed.

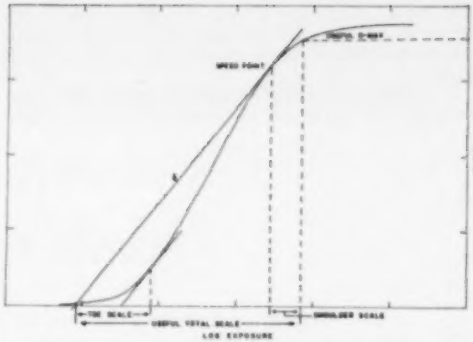


Figure Two. Five characteristics which constitute a complete specification for the sensitometric attributes of a photographic paper.

The way that these quality characteristics fit together in describing paper quality is graphically shown in the accompanying figure. While no suggestion is made that this breakdown is unique or represents the ultimate in descriptive systems, experience has shown that when these characteristics are defined, the effective printing quality is well established, excluding such aesthetic attributes as image color, stock color, or stock texture. (See Figure Two.)

This compromise proposal to supply American Standard paper quality data admittedly will not equate manufacturers reported grade numbers to an equal level, but will give the consumers a great quantity of information and permit the following important trade applications:

1. By matching negative density ranges with comparative paper Log Exposure scale values, the proposed data will permit preselection of papers that will fit any given negative.
2. An accurate estimation of the final print quality can be derived through a comparison of, and an understanding of, the relationships of the paper scale values given. The consumer is thus in a position to select papers intelligently to satisfy his own aesthetic demands.
3. The speed values reported would provide a means of predicting paper exposure relationships on any normal type of equipment, when the total useful exposure scale of the paper is used.
4. The data suggested are adequate for all procurement specifications when suitable ranges are imposed on each of the values.
5. The data suggested fulfill all the requirements of the automatic types of printing systems which must have accurate and detailed information for efficient operation.

However, the above proposal and the suggested applications constitute my personal views only and cannot be construed as representing a generally accepted opinion. It is here that PSA and all other consumer, retailing, or educational organizations can be of service by defining to the ASA Committee their actual needs in paper quality data. If the ASA Committee can get a considered opinion from representative consumer groups stating what they expect to learn from American Standard data on paper quality and how they expect to utilize this information, it might be possible to revise our ASA Subgroup objective and to

plan, for the time being at least, to supply paper quality data on an American Standard basis rather than to continue attempts to establish American Standard contrast or grade numbers.

It would be my corollary suggestion to the ASA Committee that the time is now ripe to approach PSA and other consumer groups with a request that they suggest thoroughly qualified individual consumers who could work with the manufacturer's representatives on this ASA Subgroup concerned with paper quality definition. Their experience and their judgment would certainly act as a balance wheel in the deliberations of the manufacturing group.

Nuclear Explosion

Shower of Mesons Produced by a Nucleus of Calcium Which Enters the Atmosphere From Outer Space With Extremely High Energy

By Dr. Bernard Peters

Special photographic plates, called nuclear emulsions, have become some of the most useful tools in nuclear physics. The sensitivity of the emulsions has been increased during the past year to such an extent that nuclear particles traversing the emulsions will leave a visible track of developed grains even if the particle carried only a single electronic charge and travelled with the velocity of light. These new sensitive emulsions have been developed both in Europe and in this country.

The most sensitive emulsions produced in this country by the Eastman Kodak Company are called NTB3. They have been used extensively in the study of cosmic radiation. In order to intercept the cosmic ray particles as they arrive from outer space before they are destroyed by collisions with atomic nuclei of the atmosphere, it is necessary to expose plates at very high altitudes where only about 1% of the original atmosphere remains overhead. Such exposures can be made by free balloons which reach altitudes of about 100,000 feet.

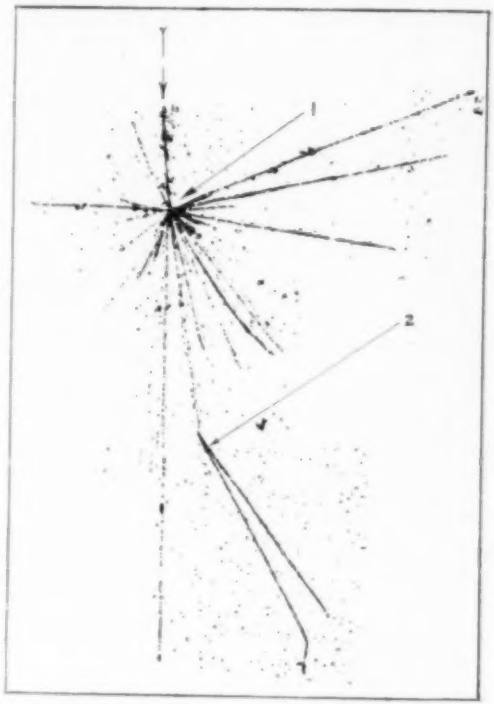
The picture* represents the disintegration of a silver nucleus of the emulsion by the impact of a primary cosmic ray particle (track no. 1). From the density of grain development along the track it can be established that particle (1) has a velocity close to that of light and carries a charge very close to 20 times as large as the charge of an electron. It is therefore a nucleus of Potassium, Calcium or Scandium.

Since this nucleus was capable of penetrating the earth's magnetic field near geomagnetic latitude $\pm 30°$, its energy must be at least 140 billion electron volts.

In the violent collision between the calcium and silver nucleus both are destroyed and 42 charged particles are emitted. From the track density of the fragments one can establish that at least 10 tracks are due to singly charged particles of velocity very close to that of light. Most of these thin tracks are believed to be π-mesons, unstable particles of weight intermediate between protons and electrons. These π-mesons are created in the collision much as photons are created in the transitions of electrons inside an atom.

At (2) one of the singly charged particles emitted in the explosion collides with some other nucleus of the emulsion resulting in its disintegration into two charged fragments.

The event illustrates the way by which the original cosmic radiation multiplies and dissipates its energy as it traverses the upper atmosphere.



Nuclear Explosion in a Photographic Emulsion Exposed to Cosmic Radiation at 93,000 Feet Altitude Near Jamaica, B.W.I. in February 1949. Courtesy of Dr. Bernard Peters and Dr. Helmut Bradt, University of Rochester. Photomicrography by Mrs. Ida Tschiderer, Kodak Research Laboratories.

*Editor's Note. Dr. Peters explains that the silver track in the photographic emulsion "is photographed through a microscope at a magnification of about 1,000. Since not all tracks are in focus at the same time it is necessary to take a great number of exposures and combine them in the same way as one does with aerial photographs."

*Influence of the Degree of Development upon the Extent of the Herschel Effect**

W. VANSELOW AND T. H. JAMES

In a previous paper[1] we have shown that latensification of a standard motion-picture positive film disappeared when development was pushed to the maximum in an energetic developer. This shows that the latensification treatment does not increase the number of developable grains. The latensification merely results in accelerated development of at least some of the developable grains. One way in which latensification can act, and which probably is the mechanism of low-intensity exposure latensification, is to increase the size of the latent-image specks. Evidently the low-intensity exposure is not capable of increasing the size of any non-developable specks sufficiently for initiating development. It seemed of interest in this connection to determine whether a short exposure to infrared light, which is known to reduce the size of latent-image specks by but one or two units[2] (e. g., silver atoms or F-centers[3]), could destroy the effectiveness of any of the specks when development was pushed to the maximum. The present investigation of the dependence of the Herschel effect upon the time of development in very energetic developers was undertaken to answer this point.

Experimental Details

The initial exposures were made on the standard Eastman IIB Sensitometer. The infrared exposures were made through a combination of one Wratten No. 25 filter and two Wratten No. 87 filters. A 500-watt lamp at 75 cm. was used as the light source. Only one wedge of each sensitometer strip was exposed to the infrared. The other

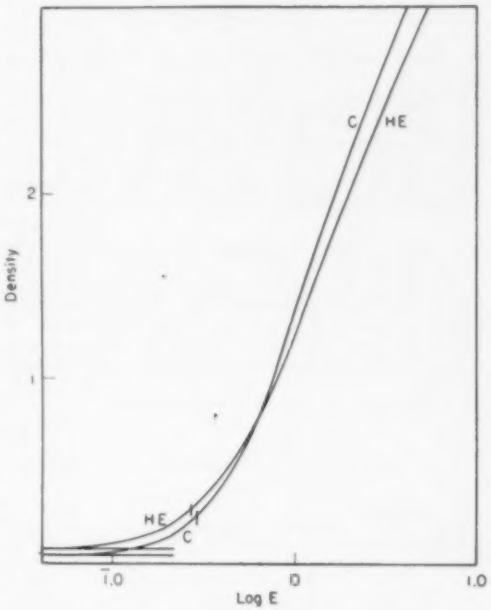


Figure 1. Film (A): HE—infrared exposure on Eastman IIB Sensitometer exposure. C—control Eastman IIB Sensitometer exposure.

*Communication No. 1266 from the Kodak Research Laboratories. Received September 10, 1949.

Table 1

Sensitometric Data for Film Developed in D-19

Film (A) Development Type	Minutes	Control Speed	Gamma	Fog	HE Duration (Minutes)	Speed	Gamma	Fog	Percentage Speed Change
D-19	2	52	1.75	0.02	30	49	1.55	0.03	− 6
	4	80	2.40	0.04	30	90	2.10	0.05	+11
	8	106	2.76	0.05	30	114	2.46	0.08	+ 7
	16	128	2.82	0.16	30	150	2.58	0.19	17
	24	144	2.75	0.32	30	165	2.50	0.36	14
	32	150	2.68	0.55	30	190	2.30	0.58	26
D-19 with 0.5 g/l α-picolinium-β-phenylethyl bromide	2	72	1.96	0.03	30	77	1.70	0.04	+ 7
	4	111	2.62	0.04	30	122	2.34	0.07	10
	8	169	2.92	0.11	30	177	2.58	0.18	5
	16	255	2.76	0.33	30	280	2.58	0.47	10
	24	280	1.84	0.75	30	255	1.62	0.94	− 9
	32	190	(1.86)	1.68	30	117	(1.70)	1.81	−38

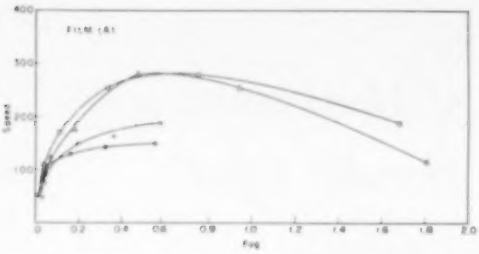


Figure 2. Film (A): —●—●— = D-19.
—X—X— = HE: D-19.
—○—○— = D19 with α-picolinium-β-phenylethyl bromide.
—Δ—Δ— = HE: D-19 with α-picolinium-β-phenylethyl bromide.

was shielded by a strip of metal foil, and was used as the control.

Development was carried out with mechanical agitation. The solutions used were Kodak developers, D-19, D-19 plus 0.5 gram of α-picolinium-β-phenylethyl bromide per liter, and Stevens's surface developer, designated as SSD. The formula for the latter is given in the preceding paper.[1] All solutions were used at 20° C.

Results

Most of the experimental work was carried out with a typical motion-picture positive film, **(A)**, since this material had been used in previous work[1] on the effect of degree of development upon the amount of latensification obtained. This film shows some sensitivity to the infrared, and the H. and D. curve representing the infrared-exposed side of the strips **(HE)** crossed that of the corresponding control in all experiments. The density in the toe image region often is increased by the infrared exposure by a greater amount than fog density, however, and an actual increase in threshold speed occurs. A typical pair is shown in Figure 1, which is for 8 minutes' development in D-19.

Tables 1 and 2 give a summary, for the various developers, of the data for speed, fog, and gamma, and the percentage change in speed caused by the infrared exposure. The infrared exposure has, in general, produced some increase in speed. The infrared exposure is, in a sense, acting as a latensifying agent with respect to speed calculated on the basis of exposure to give a density of 0.2 above fog. The course of this latensification is more clearly shown in Figures 2 and 3, where speed is plotted against fog. The speed obtained with D-19 plus α-picolinium-β-phenylethyl bromide reaches the same maximum in the presence as in the absence of infrared exposure. The same is roughly true for the surface developer containing the quaternary salt. In the absence of quaternary salt, both developers show "latensification" persisting at the longest development times used, although it is not clear that a maximum speed has been reached for these developers, and the largest speed recorded is still below the maximum speed obtained in the presence of the quaternary salt.

For a given exposure, the change in density resulting from the infrared exposure is roughly independent of the duration of the development or the nature of the developer for the solutions employed. The exposure value at which the HE curve crosses the control is practically constant and independent of the extent and nature of the development. This is illustrated by the data in Table 3.

A series of experiments was run with the surface de-

Table 2

Sensitometric Data for Film Developed in Surface Developer

Development Type	Development Minutes	Control Speed	Control Gamma	Control Fog	HE Duration (Minutes)	HE Speed	HE Gamma	HE Fog	Percentage Speed Change
Film (A)									
SSD	2	44	2.26	0.03	30	40	2.02	0.05	− 9
	4	62	2.64	0.03	30	63	2.34	0.06	+ 1
	8	97	3.10	0.03	30	111	2.75	0.06	14
	16	128	3.4	0.08	30	154	3.05	0.11	20
	32	200	3.25	0.18	30	260	3.00	0.21	30
	64	310	2.66	0.70	30	475	2.00	0.96	53
SSD with	2	52	2.02	0.03	30	50	1.90	0.06	− 4
0.5 g/l	4	81	2.60	0.04	30	89	2.38	0.07	+ 4
α-picolinium-	8	154	3.08	0.06	30	158	2.68	0.08	18
β-phenylethyl	16	210	3.16	0.10	30	245	3.02	0.14	16
bromide	32	335	2.70	0.47	30	500	2.20	0.58	49
	48	485	1.57	1.32	30	485	1.11	1.75	0
Film (B)									
SSD	2	33	3.5	0.04	15	12	4.45	0.04	−64
	4	41	3.1	0.04	15	15	4.1	0.04	−63
	8	51	3.0	0.05	15	22	3.7	0.05	−57
	16	62	3.65	0.06	15	32	3.9	0.06	−49
	32	83	3.8	0.14	15	56	3.6	0.14	−33
	48	93	3.8	0.34	15	65	3.2	0.34	−30
	64	91	3.6	0.48	15	69	3.3	0.48	−24
	80	93	3.75	0.67	15	70	3.2	0.67	−26
SSD	2	35	3.55	0.02	1	29	3.55	0.02	−17
	8	52	2.60	0.03	1	44	2.62	0.03	−15
	16	65	3.45	0.04	1	61	3.55	0.04	− 6
	32	84	3.55	0.12	1	80	3.55	0.12	− 5
	48	97	3.45	0.30	1	93	3.35	0.30	− 4
	80	104	3.50	0.64	1	95	3.25	0.64	− 9
	96	95	3.45	0.86	1	90	3.25	0.86	− 5

veloper and a high-contrast sound-recording-type film, (B). This material showed no sensitivity to the infrared for the exposures used, and in this respect the results obtained with it are simpler than those obtained with Film (A). Some preliminary experiments were made, using a 15-minute exposure to the infrared. Data for gamma, speed, fog, and speed change are given in the lower part of Table 2. The decrease in density obtained with this exposure of Film (B) was much more than that obtained with Film (A) and 30 minutes' exposure. To get more nearly comparable results, the time of exposure was reduced to 1 minute. Data on speed, gamma, fog, and speed change for this exposure are also listed in Table 2.

Table 4 gives the density decrease obtained for various values of the white-light exposure and for both 1-minute and 15-minute infrared exposure. Unlike the results for Film (A), these data show a general trend towards an initial increase of density change with increasing time of development. With prolonged development, however, the density change passes through a maximum and subsequently decreases.

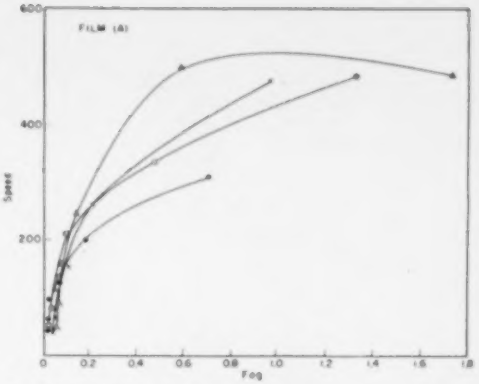


Figure 3. Film (A): —●—●— = SSD.
—X—X— = HE: SSD.
—O—O— = SSD with α-picolinium-β-phenylethyl bromide.
—Δ—Δ— = HE: SSD with α-picolinium-β-phenylethyl bromide.

Conclusions

With Film (A), the loss of density produced at high densities by the infrared exposure is nearly constant over a wide range of development times and for all developers tested. This implies that the absolute number of grains made undevelopable by the infrared exposure is essentially independent of the development time and the developer used. The *relative* number of grains made undevelopable, however, decreases steadily with increasing time of development.

On the low-exposure side of the crossing point of the HE and control curves, the change in density (increase)

Table 3

Density Change Produced by Infrared Exposure of Film (A)

Time of Development (Minutes)	Developer	Δ Density for log E 0.5	0	$\bar{1}.5$	Curves Cross at log E
2	D-19	−0.22	−0.09	+0.03	$\bar{1}.73$
4		.24	.09	.04	$\bar{1}.89$
8		.24	.10	.07	$\bar{1}.80$
16		—	.08	.09	$\bar{1}.72$
24		—	.10	.06	$\bar{1}.71$
32		—	.04	.09	$\bar{1}.94$
2	D-19 plus α-picolinium-β-phenylethyl bromide	−0.20	−0.06	+0.04	$\bar{1}.80$
4		.22	.08	.07	$\bar{1}.77$
8		—	.07	.06	$\bar{1}.80$
16		—	.06	.06	$\bar{1}.80$
24		—	.07	.05	$\bar{1}.70$
2	SSD	−0.24	−0.07	+0.04	$\bar{1}.84$
4		.29	.10	.06	$\bar{1}.81$
8		.26	.07	.07	$\bar{1}.82$
16		—	.09	.10	$\bar{1}.79$
32		—	.07	.10	$\bar{1}.71$
64		—	—	.20	$\bar{1}.82$
2	SSD plus α-picolinium-β-phenylethyl bromide	−0.25	−0.08	+0.04	$\bar{1}.80$
4		.19	.10	.06	$\bar{1}.76$
8		—	.07	.07	$\bar{1}.82$
16		—	.05	.09	$\bar{1}.75$
32		—	—	.08	$\bar{1}.72$
48		—	—	.05	$\bar{1}.63$

Table 4

Density Decrease Produced by Infrared Exposure of Film (B)

Strip No.	Development SSD (Minutes)	HE Duration (Minutes)	Δ D for log E = 0.9	0.4	0.2	1.1	1.4
61	2	1	−0.18	−0.18	−0.14	−0.06	−0.02
62	8	1	.18	.18	.18	.10	.03
63	16	1	—	.14	.18	.16	.03
64	32	1	—	—	.12	.14	.07
65	48	1	—	—	.13	.09	.07
67	80	1	—	—	.14	.14	.09
68	96	1	—	—	.11	.09	.04
1	2	15	−1.09	−0.81	−0.46	−0.12	−0.02
2	4	15	1.08	1.01	.60	.17	.03
3	8	15	—	1.22	.88	.28	.05
4	16	15	—	1.44	1.29	.54	.07
5	32	15	—	—	1.17	.78	.17
6	48	15	—	—	.95	.66	.25
7	64	15	—	—	.80	.60	.22
8	80	15	—	—	.76	.51	.19

becomes greater with increasing time of development in the solutions which do not contain the quaternary salt. There is no evidence of such a trend for the data on development in D-19 containing quaternary salt, and the existence of such a trend is doubtful for the surface developer containing the quaternary salt.

Interpretation of the data for Film (A) is complicated by the superposition of latent-image formation upon latent-image destruction during the infrared exposure. The peculiar lack of dependence of the density loss upon development time and conditions may be the result of a balancing of these two factors. The constancy of density change was not observed in the experiments with Film (B), where the infrared sensitivity was not a factor.

With Film (B), the density change at first increases with increasing time of development in the surface developer, passes through a maximum, and then decreases. In general, the shorter the white-light exposure, the longer is the time required to reach this maximum density change. The relative change of density, however, does not increase. It remains substantially constant up to 8 to 16 minutes, then decreases rapidly. In no instance, however, was the Herschel effect eliminated by prolonged development. A substantial effect still remained at the point where the fog-corrected image density reached the maximum, and hence we may conclude that a portion of the development centers formed by the white-light exposure has been destroyed effectively by the infrared exposure. This destruction has been accomplished by one quantum per center, i.e., by the removal of one silver atom or F-center per latent-image center. It may be, however, that complete destruction of the latent-image centers has occurred. The removal of a single unit from a development center of threshold size may lead to subsequent complete disintegration of that center. There is nothing in the results of Kornfeld and James to preclude this possibility.

References

1. T. H. James and W. Vanselow ("Dependence of Latensification upon the Degree of Development of a Photographic Material"), *PSA Journal*, **15**, 688 (1949). The Stevens developer for surface image: Solution A: 2.2 g. Elon, 8.8 g. hydroquinone, 1 cc. sulfuric acid (concd.), and water to make 200 cc. Solution B: 48 g. sodium carbonate monohydrate, 8 g. sodium sulfite (desic.), 100 g. potassium nitrate, 25 g. sodium sulfate, 4 g. potassium bromide, and water to make 800 cc.
2. G. Kornfeld and T. H. James, *J. Optical Soc. Am.* **33**, 615 (1943).
3. J. W. Mitchell, *Phil. Mag.*, (7) **40**, 249 (1949).

PHOTO-FACTS

Infra-Red Newsreels

British motion-picture audiences are seeing newsreels taken with infra-red film these days. Sports and national events are the principal subjects.

L. Castleton Knight, general manager of Gaumont British News, spearheaded the use of I-R film for this purpose. His technicians used it effectively at Ascot and at Henley.

Using normal Kodak 35mm stock, its users say it presents few technical difficulties over panchromatic emulsion photography beyond the use of a suitable filter—either Wratten 25 or 88.

"Functional Photography," published in London, reports that the I-R film has proved satisfactory for certain types of pictorial photography. It would not be suitable, however, for close-up crowd scenes. Faces lose all suggestion of color and appear flat white.

"However," the British magazine asserts, "for events such as the Henly Regatta, infra-red material proves itself to be a most artistic and practical medium."

Infra-Red Movies

And more about infra-red! The film industry in Hollywood—Universal-International, in particular—had "discovered" that this film is practical for shooting night scenes in broad daylight, without the need for costly lighting equipment that night shooting entails.

In five of Universal's recent films, night scenes were made on infra-red film. They were filmed at four large Southern California air fields in broad daylight for one of the pictures. Special makeup was needed, of course, to cover up "five o'clock shadow" on faces of actors and overcome the pasty white appearance otherwise obtained.

A Universal technician summed up this way: "We obtained night effects here that we could not possibly have gotten were we to shoot at night with lights. Besides, the cost of transporting to the location and using the necessary number of lights would have been prohibitive."